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Re-accredited 'A' by NAAC. Permanently Affiliated to Bengaluru City University. Approved by Government of Karnataka. Approved by AICTE, New Delhi, Recognized by UGC under 2f & 12B of UGC act 1956.

Dated: 04/05/2022

(National Institutional Ranking Framework, Ministry of Education, Govt of India)
Ranked 62" in NIRF India Ranking by MHRD, New Delhi
DBT Star College Scheme

DBT Star College Sch

Ref No.MSRCASC/CHEM-BIOCHEM/2021-22/27

CIRCULAR

Department of Chemistry and Biochemistry

A value-added course on the topic "Exploring the chemistry of nanomaterials" will be starting for B.Sc. Chemistry students from 9th May to 31st May 2022. This course will enlighten the students with recent developments in different experimental systems used in the synthesis of newer nanomaterials, characterization, and applications. Course duration is 30 hours. Interested students can enroll their name with Mr. Bharath K. Devendra/Mrs. Smrithi S.P on or before 06/05/2022.

Course Facilitators

Mr. Bharath K. Devendra Assistant Professor Department of Chemistry/Biochemistry MSRCASC

Mrs. Smrithi S. P Assistant Professor Department of Chemistry/Biochemistry MSRCASC

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Head of the Department
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M.S. Ramaiah College of Arts.

Science & Commerce

M.S. Ramaiah College of Arts, Science & Commerce MSRIT Post, MSR Nagar

Bangalore - 560 054



Resource Remon

Industry experts and renowned Professors from prestigious institutions.

Coordinators

- Mr. Bharath K. Devendra MSRCASC, Bengaluru. Assistant Professor.
- MSRCASC, Bengalura. Mrs. Smrithi S.P. Assistant Professor.

Hands on training on Synthesis & Analysis of nanomaterials

- Hydrothermal technique.
- Solution Combustion method.
- Sonochemical Synthesis.
- Co-precipitation method
- Sol-gel method.
- UV-Visible Absorbance Spectroscopy.

About the Programme

The Department of Chemistry & Biochemistry takes the lend on a variety of co-academic activities with the smiler lines, department has organized an add-on post of developing students' skills in all areas. In the course entitled "Exploring the chemistry of nanomaterials" for UG students of Chemistry. This mogram is preferably for selected students interested in pursuing further career in the field of contemporary knowledge in Chemistry research in research and industry. This program will further inculcate research interest, zeal, enthusiasm and the aspiring candidates.

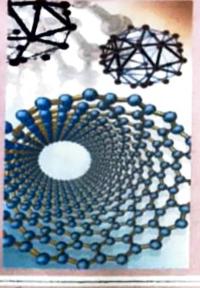
Resource persons of this program include industry experts, renowned professors from prestigions institutions and the faculties of the Department of Chemistry, MSRCASC, with a chemistry. The order of the sessions is made to maintain the flow of the main topic of the add-on management for giving an opportunity to sound research experience in the domain of mano-Chemistry/Biochemistry is thankful to department organize such programs.





Value-added Course On

"Exploring the chemistry of nanomaterials"



Duration:

9th May to 31st May - 2022

Research Center and Room No. 504 Chemistry UG/PG lab/ Chemistry Venue

M.S. Ramaiah College of Arts, Science and Commerce, Bengalura - 560054 Department of Chemistry and Organized by: Blochemistry

M.S. Ramaiah College of Arts, Science and Commerce

Dr. M S Ramaiah, a visionary and philauthropist established "Golcula Education Foundation (GEF)", in the year 1962, to deliver education and healthcare for the betterment of mankind. Under the tutelage of GEF, M.S Ramaiah college of Arts, Science and Commerce (MSRCASC) was established in 1994. MSRCASC is Re-accredited with "A" Grade by NAAC, permanently affiliated to Bengaluru City University (BCU), and approved by AlCTE, New Delhi.

The college offers seven UG courses and four PG courses in Arts, Science, and Commerce, to around 2000 students. The Department of Life Sciences conducts 2 UG and 4PG Programs in Microbiology, Chemistry, Biotechnology and Biochemistry to about 800 students. The dedicated academic faculties from our college have extensive leaching experience and have pursued doctoral and postdoctoral work in eminent institute's in India and abroad. Ramaiah College not only educates young students to excel academically, but also strives hard to ingrain social responsibilities in them.

Department of Chemistry and Biochemistry

The Department of Chemistry and Biochemistry was established in the year 1994 and currently conducts both UG and PG courses in Chemistry and Biochemistry. The syllabus is constantly supported by current day, real life applications carrying utility value. The department has very good infrastructural facilities to carry out teaching and research activities. Highly qualified faculties are assigned with theory and practical classes and are instructed to emphasize on the Tearning' of the students. The department undertakes research projects of national importance in the field of biological chemistry and has attracted finds from various agencies.

Through the sincere effort of our faculty we have obtained many University ranks, 90-100% results in both UG and PG courses consistently. Our students have been placed in various companies and many are pursuing their higher educations in India and abroad. We encourage students in doing research, present papers at National conferences, publish their findings in Journals of repute and also participate in co-curricular and extracuricular activities.

Organizing Committee Members

Dr. Nagarathna A

Principal,

MSRCASC, Bengaluru.

Mr. Prasanna Kumar S. G.

Associate Professor, HOD of Chemistry/Biochemistry MSRCASC, Bengaluru

Mr. Bharath K. Devendra Awistant Professor MSRCASC, Bengaluru

Mrs. Smrithi S.P.

Assistant Professor MSRCASC, Bengaluru Dr. Harvesh Kumar, P Assistant Professor MSRCASC, Bengaturu

Registration link

https://forms.gle/YUXlxVNnQ3HpJDW28



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DBT Star College Scheme

Report on Value-added program

Title: Exploring the chemistry of nanomaterials

Duration: 30 hours

Course Facilitators: Mr. Bharath Devendra and Mrs. Smrithi. S. P

Program Dates: 09.05.2022 to 31.05.2022

Department of Chemistry & Biochemistry takes initiative for a myriad of co-academic activities with an intent to develop the skills of students in all the respects. In the similar lines, department has organized an add-on course entitled "Exploring the chemistry of Nanomaterials" for UG students of Chemistry. This program is preferably for selected students interested in pursuing further career in the field of research and industry. This program will further inculcate research interest, zeal, enthusiasm and contemporary knowledge in Chemistry research in the aspiring candidates.

The curriculum for this program is framed inorder to familiarize the under graduate students about the chemistry of recently emerged newer materials. Nanotechnology has offered a great improvement in science, engineering, medicine, biomedical engineering, food technology, packing technologies, clothes, robotics, and computing from the beginning of twenty-first century. The next decade is likely to witness major strides in the exploitation of nanomaterials, nanotubes and other nanounits and their assemblies. In addition, there will be progress in the discovery and commercialization of nanotechnology based devices and hence enormous job prospects in industry are expected. The program is conducted in offline mode and constituted 30 credit hours with 20 hours theory and 10 hours practical classes.

The course is designed to impart the basic knowledge on the uniqueness in the properties of nanomaterials and their synthetic strategies. Additionally, the advanced carbon nanomaterials such as fullerenes, single walled and multi-walled carbon nanotubes, carbon nanowires, graphene, graphene oxide, reduced graphene oxide, carbon quantum dots and some bioinorganic nanomaterials were also been introduced to the students.An

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elaborate discussion about the various applications proposed for the nanomaterials in energy, environment and biomedicine has also been carried out.



Fig.1- Introduction lecture by the course facilitator, Mr. Bharath K.Devendra



Fig.2- Introduction lecture by the course facilitator, Mrs. Smrithi S. P.

In addition to the theory classes, the value added program on "Exploring the chemistry of nanomaterials" organized by the department of Chemistry/Biochemistry involved the familiarization of different equipments required for the synthesis of nanomaterials like

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hydrothermal reactor, vacuum oven, ultrasonicator, ultracentrifuge, vacuum oven etc. to the enrolled students



Fig.3- Demonstration on the use of hydrothermal autoclave reactor.



Fig.4- Demonstration on the use of hot air oven.

Additionally, hands on experience on the green synthesis of carbon dots, sonochemical and co-precipitation techniques for metal oxideshave been provided for the students.

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Fig.5- Hands on experience in nanoparticle synthesis

During the program, a visit to Center for Bio & Energy Materials Innovation (CAM!) Lab, M.S. Ramaiah Institute of Technology has been arranged for the enrolled students. A brief lecture about various synthesis techniques of nanomaterials with emphasis to solution combustion technique has been given by the resource person, Dr. R Hari Krishna, Assistant Professor, Department of Chemistry, M.S. Ramaiah Institute of Technology, Bengaluru.



Fig.6- Lecture on solution combustion synthesis by Dr. R. Hari Krishna, Assistant Professor, Department of Chemistry, M.S. Ramaiah Institute of Technology, Bengaluru.

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The lecture was followed by a demonstration of solution combustion synthesis by the resource person, Mr. Preetham, Junior research fellow (DST-SERB project), Ramaiah Institute of Technology, Bengaluru. The synthesis of alumina and ceria using different organic fuels has been demonstrated by the resource person.



Fig.7-Demonstration on the solution combustion synthesis by Mr. Preetham, Junior Research Fellow, M.S. Ramaiah Institute of Technology, Bengaluru



Fig.8- Images of the synthesized nanomaterials

The program concluded with the demonstration of analysis of the optical properties of the synthesized nanomaterials. The principle and the demonstration of UV-Visible absorption

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spectrophotometer have been provided by Dr. Hareesh Kumar. P, Assistant Professor, Department of Chemistry/Biochemistry, MSRCASC, Bengaluru.

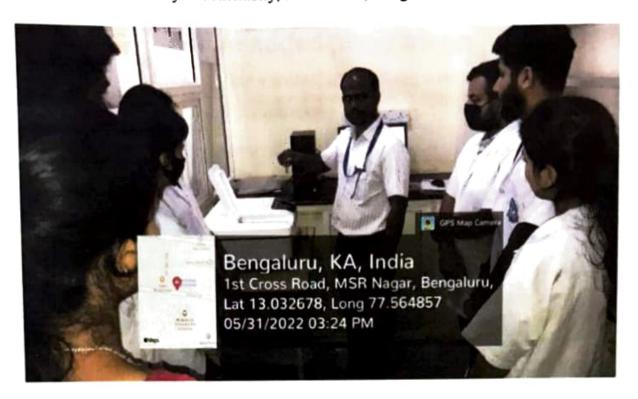


Fig.9- Demonstration/Hands-on session on the UV-Visible absorption Spectroscopy by Dr. Hareesh Kumar. P, Assistant Professor, Department of Chemistry/Biochemistry, MSRCASC

The course commenced on 09.05.2022 and ended on 31.05.2022. At the end of the program, the participants gained the knowledge about the general synthesis techniques, properties and the applications of nanomaterials in various fields. Students from sixth semester B.Sc. course had participated enthusiastically throughout the program and are benefitted.

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M.S. Ramaiah College of Arts, Science and Commerce Department of Chemistry/Biochemistry

Value-added program on

"Exploring the chemistry of nanomaterials" Students List

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28	ROHINI RAMAPPA	S1914559	Robini R.
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M.S. Ramaiah College of Arts, Science and Commerce Department of Chemistry/Biochemistry Value-added program on

"Exploring the chemistry of nanomaterials" Attendance details

09/06/2022 from 31/06/2022

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Signature of the faculty in charge

1. Smrithi S.P. Groute.
2. Bharath Devendra K. Moure

Head of the Department CHEMISTRW/ BIO-CHEMISTRY M.S. Rameiah College of Arts, Science & Commerce Bangaiore - 560 054

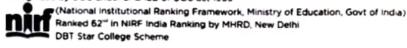
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Bangalore - 560 054



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M.S. RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE

DEPARTMENT OF CHEMISTRY/BIOCHEMISTRY

VALUE ADDED PROGRAMME ON "Exploring the chemistry of nanomaterials" Question paper (Theory)

Instructions: Answer Part A and Part B is compulsory.

Time: 1 Hr Maximum marks: 15

Part A

Answer any five questions

 $(5 \times 2 = 10)$

- 1. Why do nanomaterials show properties different from their bulk counterparts?
- Name two top-down synthetic strategies for nanomaterial preparation.
- Mention two applications of graphene.
- Give two applications of 2D-metal organic framework.
- 5. What is the principle behind the use of magnetic nanoparticles in cancer treatment?
- Write the classification of nanomaterials based of dimension.
- 7. How nanomaterials work as chemo sensors?

Part B

Answer any one question

 $(5 \times 1 = 5)$

- Explain the biomedical applications of nanomaterials.
- Explain the bottom-up techniques used for nanomaterial synthesis.
- Explain the sol-gel synthesis technique.

LS Ramaidit College of Arts Science & Commerce MSRIT Post, MSR Nagar Bangalore - 560 054

M.S. RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE DEPARTMENT OF CHEMISTRY/BIOCHEMISTRY

VALUE ADDED PROGRAMME ASSESSMENT MARKS (Theory & Practicals)

Topic: Exploring the chemistry of nanomaterials.

SI.	Register	Name of the student	Practical skill	Assignment	Attendance	Test	Total
No.	Number		(5 M)	(5 M)	(5 M)	(15 M)	(30 M)
1	S1914579	SNEHA S	5	5	5	14	29
2	S1914542	PARINITHA MOHAN	5	5	5	15	30
3	S2014607	VAISHNAVI K R	5	5	5	15	30
4	S1914592	SYED MOMIN MUSKAN	5	5	5	15	30
5	S1914597	TEJASHWINI K	5	5	5	15	30
6	S1914488	CHANDANA A	5	5	5	14	29
7	S1914586	SUJITH P	5	5	5	15	30
8	S1914569	SANJANA L NICKAM	5	5	5	15	30
9	\$1914539	NIVEDHA S	5	5	5	15	30
10	S1914582	SPOORTHY BANKALAGI	5	5	5	13	28
11	S1914606	VIHARIKA S	5	5	5	15	30
12	S1914503	HARSHITHA P	5	5	5	15	30
13	S1914600	VAISHNAVI SP	5	5	5	15	30
14	S1914474	ANKITHA B S	5	5	5	15	30
15	S1914489	CHANDRIKA SINGH	5	5	5	13	28
16	S1914562	SA VISHRUTHA	5	5	5	15	30
17	S1914499	DIYA JETTY KAZHUNNADIYIL	5	5	5	13	28
18	S1914578	SHWETHA B R	5	5	5	15	30
19	S1914514	KAVYA.M.M	5	5	5	15	30
20	S1914567	SANDEEP REDDY P.C	5	5	5	15	30
21	S1914614	Y.VYBHAV KUMAR REDDY	5	5	5	15	30
22	S1914614	YASHAVANT ARADHYA C	5	5	5	15	30
23	S1914612	YAMINI TS	5	5	5	15	30
24	S1914610	Y MANIKANTAREDDY	5	5	5	15	30
25	S1914549	P S AMAYA THEJAS	5	5	5	15	30
26	S1914540	NIVEDHA.V	5	5	5	15	30
27	S1914605	VEDIKA RAMYA KUTTANDA	5	5	5	15	30

Principal,

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M.S. RAMAIAH COLLEGE OF ARTS, SCIENCE AND COMMERCE DEPARTMENT OF CHEMISTRY/BIOCHEMISTRY

VALUE ADDED PROGRAMME ASSESSMENT MARKS (Theory & Practicals)

Topic: Exploring the chemistry of nanomaterials.

SI. No.	Register Number	Name of the student	Practical skill (5 M)	Assignment (5 M)	Attendance (5 M)	Test (15 M)	Total (30 M)
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27		VEDIKA RAMYA	5	5	5	15	30
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28	\$1914559	ROHINI RAMAPPA	5	5	5	15	30
29	S1914561	SR YASHASWINI	5	5	5	15	30
30	S1914587	SUPRIYA R	5	5	5	15	30
31	S1914536	NEHAL SUBBA	5	5	5	15	30
32	S1914578	RAMZANA BANU S	5	5	5	15	30
33	S1914591	SWARUPA BANERJEE	5	5	5	15	30
34	S1914574	SHRADDA	5	5	5	15	30
35	S1914593	T N RAMYASHREE	5	5	5	15	30
36	S1914523	MANOJ KUMAR S	5	5	5	14	29
37	S1914524	MANTHAN SINGH	5	5	5	14	29
38	S1914534	NAGARAJ MM	5	5	5	15	30
39	S1914535	NAYAN M	5	5	5	15	30
40	S1914538	NIKHITHA C THAMMAIAH	5	5	5	15	30
41	S1914588	SURABHI SRINIVAS	5	5	5	15	30
42	S1914583	SRIJA ROY NANDY	5	5	5	15	30
43	S1914584	SUDEEP M	5	5	5	14	19
44	S1914585	SUHAS TS	5	5	5	15	30
45	S1914581	SURENDAR L	5	5	5	15	30
46	S1914559	RAJESH S	5	5	5	15	30

Total no. of students participated: 46

Program coordinator

Head of the Department
Head of the Department
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Bangalore - 560 054

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Gertificate of Participation

This Certificate is presented to

Ankitha BS [S1914474]

has participated in value added program on "Exploring the Chemistry of Nanomaterials"

organised from 09.05.2022 to 31.05.2022 at the Department of Chemistry/Biochemistry,

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Mr. Bharath K. Devendra Co-ordinator

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Mr. Praşanna Kumar S G

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Manoj Kumar S [51914523]

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Supriya R [51914687]

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5. 4. 2.2 Mr. Prasannb Kumar S G

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SA Vishrutha LS1914562]

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Manthan Singh [51914524]

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Shwetha BR [51914578]

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Surendar L [51914581]

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Mr. Bharath K. Devendra

Devendra Mr. Pi

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Harshitha P [51914503]

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M.S. Ramaiah College of Arts, Science and Commerce, Bengaluru.

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(Re-accredited "A" by NAAC, affiliated to Bengaluru City University, Approved by Government of Karnataka, Approved by AICTE, New Delhi, Recognised under 2(f) and 12 B of UGC act 1956.
Ranked 62nd in NIRF India ranking by Ministry of Education, Government of India.

Certificate of Participation

This Certificate is presented to

S R Yashaswini [51914561]

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