

# Interdisciplinary Research-oriented Online Faculty Development Program

29th September to 13th October, 2021

## Report

The Departments of Physics and Chemistry, Sacred Heart College for Women, Chalakudy, conducted a Two Week Interdisciplinary research-oriented Online Faculty Development Programme on “**Structural Analysis Using Rietveld Refinement, Microscopic and Compositional Analysis**” in collaboration with the six colleges of Kerala (Bishop Moore College, Mavelikkara, St. John’s College, Agra, Catholicate College, Pathanamthitta, St. Joseph’s College for Women, Alappuzha, Assumption College (Autonomous), Changanacherry and St. Joseph’s College (Autonomous), Irinjalakuda) and GAD-TLC of MHRD, under the Govt. of India, in the time schedule of 29 September to 13 October 2021.

Dr. Nijo Varghese from the Department of Physics and Dr. Santhosh Paul from the department of Chemistry were the conveners of the program from the college’s side. Dr. Sr. Reena Ittychan and Ms. Fency K F from the department of Physics and Dr. Laina A L from the department of Chemistry successfully completed the course.

The programme was arranged as different sessions which covered expertise in material science and research. Each session was handled by experts in the particular field. On the inauguration day 29 September 2021, the Chief Patron address was given by Dr. Vimal Rarh, Project Head and joint Director GAD TLC. Also the keynote address of the FDP was given by Prof. A. K. Bakshi, Vice Chancellor, PDM University, Haryana and the Chairman of GAD-TLC of MHRD. He spoke on the topic “Achieving Excellence in Science in India in the 21st century - Challenges and Opportunities”. He covered topics like Qualities of a good teacher, Gender gap in research and Challenges faced by researchers in the 21st scenario. The session was chaired by Dr. Tintu K Kuruvilla, Assistant Professor of Physics, Bishop Moore College, Mavelikara.

## Brochure indicating the Collaboration between institutions:



**GURU ANGAD DEV  
TEACHING  
LEARNING  
CENTRE**



**MINISTRY OF  
EDUCATION  
GOVT. OF INDIA  
PANDIT MADAN  
MOHAN MALAVIYA  
NATIONAL  
MISSION ON  
TEACHERS AND  
TEACHING  
(PMMNMTT)**

**Two-Week Interdisciplinary Online  
Faculty Development Program/  
Refresher Course / Certificate Program**

**Structural Analysis Using  
Rietveld Refinement,  
Microscopic and  
Compositional Analysis**

**29 September to 13 October 2021**

*In collaboration with*

 <b>St. John's College</b> Agra	 <b>Bishop Moore College, Mavelikara</b>	 <b>Catholicate College Pathanamthitta</b>	 <b>Sacred Heart College, Chalakudy</b>	 <b>Christ College (Autonomous) Irinjalakuda</b>
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**Topics Covered:**

- Basics of X-ray Diffraction
- Rietveld Refinement
- Scanning Electron Microscopy
- Transmission Electron Microscopy
- X-ray Photoelectron Spectroscopy
- Intellectual Property Rights
- Research Ethics
- The Art & Science of Writing a Publishable Article
- Productive Research

- ❖ *Equivalent to Face to Face Two Week FDP.*
- ❖ *Fulfills Requirement as per CAS of UGC and AICTE for Promotional Requirements of Teachers*
- ❖ *All Science Faculty Members & Research Scholars Can Apply*
- ❖ *Registration fees: **Rs.1260/-***  
*(Inclusive of Course Fee, Study Material & Certificate)*

**Beneficiary Details**

A/c Holder Name : Bishop Moore College  
A/c number : 57040426450  
IFSC : SBIN0070089  
Bank : SBI, Mavelikara Town



**To Register  
Click here**

**❖ Last Date for Registration: 5 pm on 24 September 2021**

**About GAD-TLC of MHRD**

“Guru Angad Dev Teaching Learning Centre” is a centre of MHRD under the Pandit Madan Mohan Malviya National Mission on Teachers and Training (PMMNMTT) of the MHRD, Govt. of India. The objectives of the Teaching Learning Centre are to prepare Modern age teachers. Under this centre many National level activities like Seminars, FDPs and workshops at both basic and advanced level are being conducted to empower the teachers in ICT skills, develop teaching kits / teacher’s tools and ICT empowered pedagogies to enhance teaching-learning process. In its various programmes, around 55,000 teachers across the nation have benefitted till now. GAD TLC is also organizing Student Specific Training Courses to upgrade their skills as required for their Professional Development.

<b>Prof. A.K. Bakhshi</b> Vice-Chancellor, PDM University, Haryana Chairman, GAD-TLC	<b>Prof. K.V. Bhanu Murthy</b> Professor, DTU Vice-Chairman, GAD-TLC	<b>Prof. Jaswinder Singh</b> Principal, SGTB Khalsa College Director, GAD-TLC	<b>Dr. Vimal Rarh</b> Project Head & Joint Director, GAD-TLC
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# The details of the institutions participating in the collaboration



## Two-Week Interdisciplinary Online FDP Structural Analysis Using Rietveld Refinement, Microscopic and Compositional Analysis

29 September 2021- 13 October 2021



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### About the Collaborating Colleges



**Bishop Moore College, Mavelikara**, established in 1964 and affiliated to the University of Kerala, has been awarded A grade by NAAC in the 3rd cycle of accreditation and ranked 76 among the Colleges in India in the NIRF ranking 2020. The College offers 11 undergraduate, four postgraduate and two research programmes in Science, Commerce, Arts and Humanities along with two UGC-sponsored add-on courses, and also provides opportunities for students to carry out Summer Research Projects at reputed institutes in the country. The undergraduate programmes in the Science departments are supported under the DBT-STAR College scheme. The College has become an active hub of research with well equipped laboratories, over 100 publications in international journals, a number of completed major and minor research projects, the research facilities being enhanced by utilizing funds under the DST-FIST scheme and KSCSTE SARD project scheme. The research centres have collaborative projects with institutes like the UGC – DAE Consortium for Scientific Research, BARC Mumbai and IUAC, Delhi.



**St. John's College, Agra**, was established in 1850 by the Church Missionary Society of England through the efforts of the Agra C.M.S. Association which came into being in 1840. From 1862 to 1888 the College remained affiliated to Calcutta University and later up to 1927 to Allahabad University. In 1927 with the formation of Agra University, the then Principal of the College Dr. A.W. Davies became its first Vice-Chancellor and the College was affiliated to the Agra University. The college became a First Grade College in 1891 with B.A. and LL. B. classes, and affiliation was granted in 1893 for postgraduate classes. Thus it has the rare distinction of being a postgraduate institution of more than a century's standing. The college has sixteen post graduate departments with facilities for research and three undergraduate departments. The college also runs five self-financed recognized courses viz, B.Com(Vocational), B.B.A., B.Ed, D.El.Ed, M.A(Urdu), Post Graduate Diploma in Clinical Psychology and two partially self-financed degree programs in B.Sc with Industrial Chemistry & BSc with Computer Science. The foundation stone of the Centenary Wing was laid by Bharat Ratna Sarvapalli Radhakrishnan, former President of India, in 1958 and was opened by Bharat Ratna Pt. Jawaharlal Nehru, the first Prime Minister of India, in 1959, with the words "I have come to pay tribute to this temple of learning." The College has very distinguished alumni, the foremost of them being the late Dr. Shanker Dayal Sharma, the former President of India present situation.



**Catholicate College, Pathanamthitta** founded in 1952 on the serene Basil Hills has a rich legacy of almost seven decades and is affiliated to Mahatma Gandhi University, Kottayam.. The motto of this temple of learning is "Fear of the Lord is the beginning of wisdom." It imparts value-based education aimed at the holistic and intuitive growth of the individual so as to fulfill the vision of creating an educated and enlightened society for a brave new world. It has been re-accredited by NAAC with CGPA 3.60, A Grade and is one of the Thirteen special grade colleges in Kerala. The college has eight research departments and offers fifteen PG Programmes, thirteen UG Programmes and one Integrated MA Programme in the aided stream. The college was identified by the department of science and technology, government of India, for FIST funding. The college has been awarded ISO 9001-2008 certification. Current year, the college is celebrating its platinum jubilee. The college has been endeavoring to shape the destiny of a community in the fullest spirit of its stated mission, an educated, enlightened society for a brave new world.



**Sacred Heart College, Chalakudy**, is an institution managed by the Alvernia province of Franciscan Clarist congregation, affiliated to the University of Calicut and aided by the Kerala government. The College, established in 1980, as a junior college with Pre-degree courses was upgraded to a first grade status in 1991 and is presently offering eight Under Graduate and six Post Graduate courses. The motto of the college is "LUX IN TENEBRIS LUCET" (Light Shines in Darkness). The College is located in a peaceful semi urban locality, the lush green gardens and well designed infrastructure provide the perfect ambience for learning, sharing and development of the students. The college was re-accredited by NAAC with A+ grade (CGPA 3.55) in 2017. The Department of Physics has been maintaining a unique position in the College in respect of overall performance, ever since it was established. Physics Department aims at moulding totally competent physicists with ingenuity, adaptability, social commitment, ethical values and spiritual elevation that can provide innovative leadership in academia and society.



**Christ College, Irinjalakuda** was started in 1956, by the Devamatha Province of the Carmelites of Mary Immaculate (CMI), an indigenous religious congregation founded in 1831 by Saint Cyriac Elias, a religious priest and versatile genius, who envisioned education as a tool for liberation and development. Founded as per the provisions of the Indian Constitution, part III, Article 30(1) and administered by Christ College Educational Society, (Regd. No. 137/75), this college is a Minority institution. College is affiliated to University of Calicut. Christ College is included under the sections 2(f) and 12B of the University Grants Commission (UGC) and was re-accredited by National Assessment and Accreditation Council (NAAC) with A grade (3.21) in the third cycle. Following recommendation from state government; the college has been conferred the "Autonomous status" by University Grants Commission (UGC) during the year 2015, the Diamond Jubilee year of the college. Christ College is part of a century-old tradition of CMI education that is at its heart, Christian and open to all sections of society. It offers an ideal vision of education that is aware of and responsive to the challenges of the nation's present situation.

## Brochure:



### Two-Week Interdisciplinary Online FDP Structural Analysis Using Rietveld Refinement, Microscopic and Compositional Analysis

29 September 2021- 13 October 2021



#### Resource Persons

**Prof. A Sundaresan**  
Professor & Chair  
Chemistry and Physics of Materials Unit,  
Jawaharlal Nehru Centre for Advanced  
Scientific Research



**Prof. Priya Mahadevan**  
S. N. Bose National Centre for Basic Sciences  
Kolkata

**Prof. Dr. Ramesh C Gaur**  
Dean & Director (Library & Information)  
& Head,  
Kalanidhi Division, Indira Gandhi National  
Centre for Arts (IGNCA), New Delhi



**Prof. K Muralidhar**  
Former HoD, Department of Zoology,  
University of Delhi

**Dr. Suresha S. J**  
Technology Manager,  
Micro and Nano Characterization Facility,  
CeNSE, IISc Bangalore



**Prof. (Dr.) Bismi Gopalakrishnan**  
Dean, Faculty of Law  
Head, School of Indian Legal Thought  
Mahatma Gandhi University, Kottayam

**Dr. Madhu S. Nair**  
Associate Professor  
Cochin University of Science and Technology  
Cochin



**Dr. Lawwellman P.**  
Asst. Professor of Law  
Government Law College,  
Calicut.

**Dr. Madhu Chennabasappa**  
Assistant Professor  
Siddaganga Institute of Technology  
Tumkūr, Karnataka, India



**Dr. Praveen Managutti**  
University of Rennes 1,  
FRANCE

#### Organizing Committee

**Dr. Jacob Chandy**, Co-Patron, Principal, Bishop Moore College, Mavelikara  
**Prof. S. P. Singh**, Co-Patron, Principal, St. John's College, Agra  
**Dr. Philipose Omman**, Co-Patron, Principal, Catholicate College, Pathanamthitta  
**Dr. Sr. Reena Ittyachan**, Co-Patron, Principal, Sacred Heart College, Chalakudy  
**Fr. Dr. Jolly Andrews CMI**, Co-Patron, Principal, Christ College, Irinjalakuda  
**Dr. Ranjith Mathew Abraham**, Vice Principal & IQAC Co-ordinator, Bishop Moore College, Mavelikara  
**Dr. Susan Verghese P.**, IQAC Co-Ordinator, Head of the Department of Chemistry, St. John's College, Agra  
**Dr. D. Sajan**, Co-Ordinator, Head of the Department of Physics, Bishop Moore College, Mavelikara  
**Dr. Soosen Samuel M.**, Co-Ordinator, Head of the Department of Physics, Catholicate College, Pathanamthitta  
**Dr. Shaju K.Y.**, Co-Ordinator, Vice Principal and Head, Department of Physics, Christ College, Irinjalakuda  
**Dr. Jerin Susan John**, Convenor, Department of Physics, Bishop Moore College Mavelikara  
**Dr. Arun Aravind**, Convenor, Department of Physics, Bishop Moore College Mavelikara  
**Dr. Dhanya I.**, Convenor, Department of Physics, Catholicate College, Pathanamthitta  
**Dr. Nijo Varghese**, Convenor, Head of the Department of Physics, Sacred Heart College, Chalakudy  
**Dr. Santhosh Paul**, Convenor, Head of the Department of Chemistry, Sacred Heart College, Chalakudy  
**Dr. Subin K Jose**, Convenor, Department of Environment Science, Christ College, Irinjalakuda

## Dr. Reena Ittyachan, Principal, SH College, felicitated in the inaugural function



**Link sessions 1:** Topic: Online FDP Program - GAD TLC-Day 1

Start Time : Sep 29, 2021 14:26

Meeting Recording:

[https://us02web.zoom.us/rec/share/qJBDgHCN-CsCvuaF4VRtGGiiqL3\\_Fwz6xQiUNqqRyTb-o7WdjBK3rcqNn8rrRxID.v2W7S73ERilWMYjz](https://us02web.zoom.us/rec/share/qJBDgHCN-CsCvuaF4VRtGGiiqL3_Fwz6xQiUNqqRyTb-o7WdjBK3rcqNn8rrRxID.v2W7S73ERilWMYjz)

Access Passcode: @rD12JtB

In the afternoon session Prof. K. Muralidhar, Former HOD, Department of Zoology, University of Delhi and currently working on the Advisory Board of the Inter – University Centre for Teacher Education at Banaras Hindu University and a visiting Professor to Annamalai, Madras and Hyderabad Universities. He spoke on the topic “Ethics in science –

A Perspective”. Prof. K. Muralidhar started the session by explaining the Morals, Laws and Ethics, Professional Ethics, Ethics of Science, Limitations of Science and how to recognize unethical practice were explained and highlighted.

Second day of the FDP programme on 30th September 2021 starts with the interdisciplinary talk of Dr. Law Well Man P, Assistant Professor of Law, Govt. Law College, Kozhikode. He spoke on the topic “Intellectual Property Rights-Significance of Trademarks in startups and Business Enterprises”. Dr.

Law Well Man started the session by explaining the various aspects of Intellectual Properties like Patent, industrial designs, copyright, semiconductor chip, plant variety, geographical indications, trade secrets and trademarks in detail with quoting examples from our day to day life. The session was highly informative and the speaker elaborated the idea of Intellectual Property rights by quoting various examples of our daily life. The session was highly interactive and was chaired by Dr. Dhanya I, Assistant Professor of Physics, Catholicate College, Pathanamthitta.

Second session of the day is handled by Prof. Dr. Ramesh C Gaur, Dean and Director (Library & Information) & Head - Kala Nidhi Division of Indira Gandhi National Centre for the Arts (IGNCA), New Delhi. He spoke on the topic "Plagiarism in Research". The session

was narrated with different types of plagiarism and main ethics that should follow in research. The session was highly informative and was chaired by Dr. Achamma George, Assistant Professor of Physics, Catholicate College, Pathanamthitta. Finally he gave a clear idea regarding citation and referencing. All reference styles are elucidated with free software like Mendeley, Zotero and PDFVIEWERVIEW.

Lecture V & VI of the FDP programme was arranged on 02nd October 2021 and is handled by Dr. A Sundaresan, Professor in Jawaharlal Nehru Centre for Advanced Scientific Research and now he is Chair of Chemistry & Physics of Materials Unit. His lecture mainly focused on the topic "Introduction to Crystallography". The session began with basic concept of crystallography and had a detailed discussion regarding space groups, crystal structure, Bravais Lattice etc. The sessions were highly informative and got a thorough basic knowledge related to crystal systems and structures for solid state materials. The session was chaired by Dr. Achamma George and Dr. Dhanya I, Assistant Professor (s) of Physics, Catholicate College, Pathanamthitta.

Day 4 of the programme on 4 October 2021 was hosted by Christ College, Irinjalakuda and the resource person was Dr. Madhu Chennabasappa, Assistant Professor, Department of Physics, Siddaganga Institute of Technology, Tumkur, Karnataka. The topic of the day was "Structural Analysis Using Rietveld Refinement, Microscopic and Compositional Analysis". The first session began at 9.30 am with the theory of how to 'see' atoms using X rays. The use of X-ray diffraction in studying phase purity, quantification, crystalline / amorphous nature of material, strain, stress & defect detection, crystalline size detection and thickness were mentioned. The second session began at 11.30 am and the resource person is Dr. Praveen Managutti, who is pursuing post-doctoral research in France. The second session gave hands-on training for the participants.

Day 5 of FDP was hosted by Christ College, Irinjalakuda on 5 October 2021. The first session was led by Dr. Madhu Chennabasappa and he continued the lecture of the previous day on X-ray diffraction and crystallography. The first session of the day was concluded by revisiting some of the software for Rietveld refinement. The second session was led by Dr. Praveen Managutti, it is a hands-on training session and the instructor first demonstrated the use of the open source software like QualX and WinPLOTR and the session ended with the final use of the software FullProf.

Day 6 programs of FDP were coordinated by Sacred Heart College, Chalakudy on 6 October 2021 and the resource person is Dr. Madhu Chennabasappa. The session began at 9.30 am. He continued the profile matching analysis on NaCl using WinPlotr and EDPCR and he explained the Rietveld refinement by using the example of  $\text{Ba}_{0.7}\text{Zr}_{0.3}\text{TiO}_3$ . He also shown another example of multiphase identification, profile matching and introduction of atoms. The second session began at 11.40 am by Dr. Praveen Managutti who gave a hands-on training for the participants.

Day 7 programmes of FDP were arranged on 07th October 2021 and were handled by Dr. Madhu Chennabasappa. Session 13 began with different spectroscopic techniques, mapping and chemical methods of analysis. The session was chaired by Dr. Dhanya I, Assistant Professor of Physics, Catholocate College, Pathanamthitta. Session -14 of the FDP programme is also handled by Dr. Madhu Chennabasappa. The session had a detailed discussion on X-ray photoelectron spectroscopy. He also discussed the simulation technique for fitting XPS data in detail with free ware. The session was chaired by Dr. Achamma George, Assistant Professor of Physics, Catholocate College, Pathanamthitta.

Session - 15 of the FDP programme was on 08th October 2021 and is handled by Dr. Suresha S. J, Technology Manager, Center for Nano science and Engineering, Indian Institute of Science, Bangalore. The session began with fundamental idea related to Scanning Electron Microscopy and later the characterization and analysis of SEM in detail. The session was chaired by Dr. Achamma George, Assistant Professor of Physics, Catholocate College, Pathanamthitta.

Session -16 of the FDP programme was on 08th October 2021 and was handled by Dr. Bismi Gopalakrishnan, Professor, Dean, Faculty of Law, Head, School of Indian Legal Thought, Mahatma Gandhi University, Kottayam. The session began with requirements of copyright, copyright protection and fair dealing for research, study and instruction. She also discussed the difference of copyright and plagiarism in detail. The session was chaired by Dr. Dhanya I, Assistant Professor of Physics, Catholocate College, Pathanamthitta.

Session - 17 of the FDP programme was conducted on 11th October, 2021 and

was handled by Dr. Suresha S. J, Technology Manager, Center for Nano science and Engineering, Indian Institute of Science, Bangalore. The session started by recollecting his previous talk on SEM and the instrumentation, characterization and analysis of TEM and various TEM techniques in detail. The session was chaired by Dr. Santhosh Paul, Assistant Professor of Chemistry, Sacred Heart College, Chalakudy. The next session was handled by Dr. Surendran Cherukodan who holds a PhD in Library Science and he is an expert curator. He discussed about the details regarding to the productive research and the role of journal indexing and Scientometrics.

### **Dr. Santhosh Paul, faculty, SH College, is chairing the session -17**



Day 12 of the FDP programme was hosted by Christ College, Irinjalakuda on 12 October 2021. The first session of the day was led by Dr. Surendran Cherukodan. The resource person started the session by talking about the relevance of 'Productive Research'. He explained in detail the different citation indices and how they are calculated. The second session of the day was handled by Dr. Priya Mahadevan, Department of Condensed Matter Physics and Material Science, S.N. Bose National Centre for Basic Sciences. She discussed about how to publish good papers in general and especially in Physics. The session attracted a lot of applause from the participants who engaged in active discussion with the speaker at the end of the session. A feedback link was arranged to all participants after each session in order to evaluate the response of the participants to that particular session. At the end of every session participants gave excellent feedback in the chat box. On the basis of each session a quiz link was circulated among the participants on everyday in order to evaluate their level of understanding.



Also a project and assignment evaluation question was circulated among the participants to identify their output gained through this FDP programme.

The FDP programme actually gave a good platform for the teachers and research scholar's in order to enhance their affinity towards materials science and its characterization techniques. Also it provides a better understanding regarding to research publication and its ethics. We believe that this FDP programme generated a fruitful outcome to all of our participants in India and abroad. Within the limitation of online mode this FDP programme won a huge success due to its extraordinary co-ordination and participation because we believe that the process of learning knowledge have no boundaries.

### **Faculty from Sacred Heart college who has been part of this course**

<b>SL.NO.</b>	<b>Name of the faculty</b>	<b>Role of the faculty</b>
1	Dr. Nijo Varghese	Convener & Chair
2	Dr. Santhosh Paul	Convener & Chair
3	Dr. Reena Ittyachan	Participant
4	Ms. Fency K F	Participant
5	Dr. Laina A L	Participant

## Certificate issued to Dr. Nijo Varghese, Convenor of the course



Guru Angad Dev  
Teaching Learning Centre  
A Centre of Ministry of Education  
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Government of India  
Ministry of Education



Sri Guru Tegh Bahadur  
Khalsa College  
University of Delhi

# Certificate

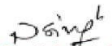
29<sup>th</sup> September to 13<sup>th</sup> October 2021

NATIONAL ONLINE REFRESHER COURSE/TWO WEEK FACULTY DEVELOPMENT PROGRAM  
(INTERDISCIPLINARY)

*Structural Analysis using Rietveld Refinement, Microscopic and Compositional Analysis*

This is to certify that

**DR. NIJO VARGHESE OF DEPARTMENT OF PHYSICS, SACRET HEART COLLEGE, CHALAKUDY**  
has contributed as **Convenor** in National Online Refresher Course/Two Week Faculty Development Program jointly organized by Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi and St. John's College, Agra; Bishop Moore College, Mavelikara; Catholicate College, Pathanamthitta; Sacred Heart College, Chalakudy & Christ College (Autonomous) Irinjalakuda under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education. This online Refresher Course/FDP is equivalent to face to face Refresher Course/FDP.

  
**Prof. Jaswinder Singh**  
Principal  
S.G.T.B. Khalsa College  
University of Delhi

  
**Dr. Vimal Rarh**  
Project Head & Joint Director  
GAD-TLC of Ministry of Education

UNIQUE CERTIFICATE No: GAD-TLC/21-22/FDP-60/OT-007



# Certificates issued to Ms. Fency K F and Dr. Sr. Reena Ittyachan



Guru Angad Dev  
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Ministry of Education



Sri Guru Tegh Bahadur  
Khalsa College  
University of Delhi

## Certificate

29<sup>th</sup> September to 13<sup>th</sup> October 2021


NATIONAL ONLINE REFRESHER COURSE/TWO WEEK FACULTY DEVELOPMENT PROGRAM  
(INTERDISCIPLINARY)

**Structural Analysis using Rietveld Refinement, Microscopic and Compositional Analysis**

This is to certify that

**REENA ITTYACHAN of SACRED HEART COLLEGE, CHALAKUDY**

has **successfully completed** National Online Refresher Course/Two Week Faculty Development Program jointly organized by Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi and St. John's College, Agra; Bishop Moore College, Mavelikara; Catholicate College, Pathanamthitta; Sacred Heart College, Chalakudy & Christ College (Autonomous) Irinjalakuda under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education. This was conducted in online mode with two week's involvement in a Flexible mode. This online Refresher course/FDP is equivalent to face to face Refresher Course/FDP. The two week's involvement included attendance during live/recorded sessions, hands on activities, submission of quizzes, assignments and project. The participant has obtained **Grade "A+"** as required for promotion under CAS of UGC and AICTE.

  
**Prof. Jaswinder Singh**  
Principal  
S.G.T.B. Khalsa College  
University of Delhi

  
**Dr. Vimal Rath**  
Project Head & Joint Director  
GAD-TLC of Ministry of Education

UNIQUE CERTIFICATE No: GAD-TLC/21-22/OFDP60/070



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Government of India  
Ministry of Education



Sri Guru Tegh Bahadur  
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University of Delhi

## Certificate

29<sup>th</sup> September to 13<sup>th</sup> October 2021


NATIONAL ONLINE REFRESHER COURSE/TWO WEEK FACULTY DEVELOPMENT PROGRAM  
(INTERDISCIPLINARY)

**Structural Analysis using Rietveld Refinement, Microscopic and Compositional Analysis**

This is to certify that

**FENCY K F of SACRED HEART COLLEGE, CHALAKUDY**

has **successfully completed** National Online Refresher Course/Two Week Faculty Development Program jointly organized by Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi and St. John's College, Agra; Bishop Moore College, Mavelikara; Catholicate College, Pathanamthitta; Sacred Heart College, Chalakudy & Christ College (Autonomous) Irinjalakuda under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education. This was conducted in online mode with two week's involvement in a Flexible mode. This online Refresher course/FDP is equivalent to face to face Refresher Course/FDP. The two week's involvement included attendance during live/recorded sessions, hands on activities, submission of quizzes, assignments and project. The participant has obtained **Grade "A+"** as required for promotion under CAS of UGC and AICTE.

  
**Prof. Jaswinder Singh**  
Principal  
S.G.T.B. Khalsa College  
University of Delhi

  
**Dr. Vimal Rath**  
Project Head & Joint Director  
GAD-TLC of Ministry of Education

UNIQUE CERTIFICATE No: GAD-TLC/21-22/OFDP60/030

## List of Participants

List of participants

	Full Name(in Capital Letters)	Whatsapp Number
1	Mary Linsa K S	9847934404
2	DR. VEENA GOPALAN E	9495272619
3	DHANYA JOSE	9562448328
4	shanu AS	9526232728
5	Aswathy B R	9400147645
6	SUMAYYA K	7025297011
7	SONA G KRISHNAN	9400498308
8	Dr. RESHMI C. P.	9349171626
9	HARIPRIYA V K	9496349350
10	Dr. JITHA KUNHIKRISHNAN M	9946368917
11	REKHA ROSE KOSHY	8891619557
12	Savitha Mathew	8547467622
13	Dr J BINOY	+91 9495413922
14	REENA	9847927972
15	DR. ROHITH M.	9496842940
16	BASSAM.S.A	9526074094
17	BASIRA NASRI VK	7510611247
18	DEEPA N BHADRAN	9961033428
19	Dr.Sreekanth J Varma	9496179724
20	SULFIKKARALI NK	9961784970
21	SMITHA S	9446852753
22	Dr. AMITH YADAV H.J.	9110237033
23	Dr. RAJI KOSHY	9497030497
24	Dr. Mary Varughese	9446682687
25	ANJU RAJAN	9497786744
26	SREE ROOP S S	9447719576
27	Dr.vinodkumar.R	8281517122
28	RISHI M	944770229
29	DEEPA RANI S	9447001175
30	MINAL AMBARISH BHATT	9428182768
31	DR. MAHIMA HABIL MASSEY	9411877727
32	SHAFEER KHAN S	9809650567
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41	CHARISHMA RAVINDRAN	7012526032
42	P K MANOJ	9495902021
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44	T SAI SANTOSHI	9441687513
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56	DR. R G VAIDYA	9916124740
57	VASANTHI B	8547871830
58	DESAI HARSHAL BAKULBHAI	9428641151
59	ATHIRA S	9544647296
60	PRABHAJYOTHI P S	9895629682
61	NIDHIN PAUL	8281731383
62	DR. VEERABHADRAYYA ALIAS RUDRAYY M	8792300875
63	ACHAMMA GEORGE	9977408843
64	VEENA V S	8547885916
65	VISHAL KOTHA	9488659155
66	REMYA M	8281357630
67	AKSHAYA S	9886661507
68	FENCY K F	9745822940
69	RANI.K.PILLAI	9447493634
70	Karthik Vinodan	9656816282
71	Deepa Thomas	9947010833
72	SANDRA SANNI	8281971653
73	S ATHIMOOLAM	9787100212
74	ATEED AHMAD	9458275531
75	Dr.A.SELVAN	8072749020
76	GAYATRI NAIR G	9496033395
77	NARAYAN GAONKAR	9448995642
78	MOHAMMED ZIYAD P A	9747616705
79	Shereef A	8943430021
80	SENA SIVADAS	9446013612
81	SAFNA K	9744095610
82	INDU TREESA JOCHAN	7559019853
83	SMITHA BHASKARAN	9544116733
84	Ramesh Chandran B R	7907916423
85	SAVITA PRIYA	7269875976
86	DR SREELEKHA M	9526115115
87	Priyadarsini G.	9497454413
88	NITHYA S VARMA	9497278568
89	VIPIN V K	9847473022
90	SOUMYAMOL K S	8848711661
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92	REMYA KRISHNAN M	9946822472
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113	Dr. Aiswarya Raj A. S.	9497815988
114	MANJUSHREE S.G	7204148771
115	DR. VAIJAYANTI JITESH AMDOSKAR	8793289248
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117	VANDANA SAHAYOG JAMDAR	9869169824
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119	Dr. Honnur Krishna	9449002086
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121	C.VINCENT JERIN	9443692835
122	ANKITA BISHNOI	9991217316
123	AKASH DANIEL GEORGI	8129134930
124	ANISHA JOSEPH	9562873889
125	Manju s john	7306090480
126	AMBA PRASAD	9400600113
127	NITHYA.P	9446222004
128	Dr. MALLIKARJUNAIAH K. J.	9844205070
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131	Merin George	9400203003
132	Aleena P A	7591918510
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134	SARITHA UK	9605574925
135	SIJI K MARY	9496883739
136	DR. SHIVANAND MADOLAPPA	9482283189
137	Dr. MANISHA TANWER	9881060912
138	JESSYAMMA KURIAN	8281920915
139	JAVEESH ALEX	9447845672