

Annual Report
2022-23
Miranda House
University of Delhi

Brief history of the College

Miranda House (MH) started its existence as a hostel for women students in 1946 from an old colonial bungalow situated at 7, Probyn Road (now renamed Chhatra Marg). The college eventually started in 1948, under the stewardship of Sir Maurice Gwyer, Vice Chancellor of the University of Delhi (1938–1950). Ms. Veda Thakurdas was appointed the first principal. 122 young women were admitted into several departments: English, Economics, Hindi, History, Philosophy, Mathematics, Sanskrit, Physics and Zoology. The college pioneered basic science education for women. Today, the college has eighteen departments that span humanities, social and natural sciences, 200 faculty members and more than 5000 students.

The history of Miranda House chronicles the history of women's education as well as that of the women's movement in post-independence India. The foundation stone for what is now the Hostel building was laid by Edwina Mountbatten on 7 March 1948. MH has created a space for quality and holistic education in the Humanities, Social Sciences and basic Sciences that is inclusive and dedicated to turning out sensitized and capable students, who aspire to be leaders and responsible citizens of the country. It has been awarded All India Rank One amongst colleges under the National Institutional Ranking Framework (NIRF) for seven consecutive years from 2017 to 2023. It has an Institutional Grade of A++ from NAAC and granted the Star College status by the Department of Biotechnology.

Major Activities and Achievements

Miranda House (MH) has aligned its focus with the National Education Policy (NEP) 2020 by emphasizing research, skill development, and outreach activities. To support this, MH has bolstered its Multidisciplinary Research Centre, dedicated to advanced semiconductor device fabrication research conducted by Ph.D. students, in line with the Hon'ble Prime Minister's mission to enhance India's self-reliance in this field.

MH showcased India's leadership at the G20 through a series of events under the theme "Making India Count - Role of Youth, Academia, and Intellectuals." The college also signed a MoU with the Korea National Sport University, marking 50 years of India-Korea Diplomatic Relations. In addition, MH achieved remarkable success by winning eight prestigious cups at the Flower Show, including the Platinum Jubilee Cup, and Centenary Cup.

MH has been recognized as a Social Entrepreneurship, Swachhta, and Rural Engagement Cell (SES REC) Institution, and as a Sustainable Campus in key areas such as Sanitation, Hygiene, Waste Management, Water Management, Energy Management, and Greenery Management by the Mahatma Gandhi National Council of Rural Education, Government of India. Notably, MH

recently earned the distinction of being the District Eco-SDG Champion 2023 with an Outstanding Performance Grade 'S' for the North Campus–Delhi District.

Honours/Distinctions

Dr. Rashmi Shakya received the International Research Experience Award by DST SERB, 2022.

Prof. Anindita Sarkar received the Delhi University Teacher's Excellence Award by the University of Delhi, 2023.

Dr. Deepak received IRSD Prominent Teacher Award at the International conference IRSD held at Jamia Hamdard New Delhi, 2023.

Prof. Kalawati Saini received International, Best Research Award for the Research & Excellence in Electrochemistry, Material Chemistry, Anticancer Activity at the Royal Research Award Ceremony, ISSN IISTAC, 2022. She also received International Young Scientist Award by Science Father, a trademark of Scifax Company.

Prof. Monika Tomar received Woman in Science Research and Academics (Award) by Kamla Power Women Award NGO, March 2023.

Students with Distinctions

Shalini Thakur of B. Sc. (H) Mathematics III year was awarded rank I in University of Delhi.

Samriddhi Mishra of B. Sc. (H) Mathematics III year was awarded rank II in University of Delhi.

Arshdeep Kaur of B.A. (H) Political Science III year was awarded rank I in University of Delhi.

Kaavya Khemka of B.A. Programme I year was awarded rank I in University of Delhi

Meenakshi of M. Sc. Mathematics Final Year was awarded rank I in University of Delhi.

Publications

Bhatt, P., Sharma, M., Sharma, P., Rathi, B., Sharma, S. (2022). Mycobacterium tuberculosis dormancy regulon proteins Rv2627c and Rv2628 as Toll like receptor agonist and as potential adjuvant. *International immunopharmacology*, 112 (0), 109238.

Jain, S., Paliwal, A., Gupta, V., Tomar, M. (2022). SPR based refractive index modulation of nanostructured SiO₂ films grown using GLAD assisted RF sputtering technique. *Surfaces and Interfaces*, 34(2), 102355.

Jeengar, C., Jindal, K., Tomar, M. and Jha, P. (2022). Study of Intrinsic Point Defects in Γ -In₂Se₃ for the Realization of an Efficient UV Photodetector. *Journal of Alloys and Compounds*, 912 (0), 165197.

Kaur, L., Rahman, J.A., Singh, A., Pathak, M., Datta, A., Singhal, R., Ojha H. (2022). Binding studies for the interaction between hazardous organophosphorus compound phosmet and lysozyme: Spectroscopic and In-silico analyses. *Journal of Molecular Liquids*, 118954(355).

Kumar, S., Kovalenk, S., Bhardwaj, S., Sethi, A., Gorobets N. Y., Poonam; Rathi B. (2022). Drug Repurposing against SARS-CoV-2 forecasted by computational approaches. *Drug Discovery Today*, 27(5), 2015-2027.

Kumari, R., Yadav, Y., Misra, R., Das, U., Adhikari, P.M., Dubey, G.P. (2022). Emerging frontiers of antibiotics use and their impacts on the human gut microbiome. *Microbiological Research*, 263(0), 127127.

Lamichhane, S., Sharma, S., Tomar, M., Chowdhuri A. (2023). Studies on energy storage properties of BFO/WO₃ bilayer thin film capacitor. *Energy Storage*, 5(1), 1-11.

Medha, Priyanka, Bhatt, P., Sharma, S., Sharma, M. (2023). Role of C-terminal domain of Mycobacterium tuberculosis PE6 (Rv0335c) protein in host mitochondrial stress and macrophage apoptosis. *Apoptosis: An International Journal on programmed cell death*, 28(1-2), 136–165.

Oak, H. and Bansal S. (2022). Enhancing energy efficiency of Indian industries: Effectiveness of PAT scheme. *Energy Economics*, 113(C).

Yadav, S., Yadav, J., Kumar, M., and Saini, K. (2022). Synthesis and characterization of nickel oxide/cobalt oxide nanocomposite for effective degradation of methylene blue and their comparative electrochemical study as electrode material for supercapacitor application. *International Journal of Hydrogen Energy*, 47(99), 41684-41697.

Research Projects

Ask PIs

North Eastern Council, Government of India, 2022-2025, Establishing the Northeastern Regional Research and Resource Centre at Miranda House, Rs. 275.40 lakhs, PI – Professor Bijayalaxmi Nanda.

DRDO, 2019-2023, Fabrication of Lamb Wave Devices on SiO₂/Si Membrane for strategic applications., Rs. 428.03 Lakhs, PI – Professor Monika Tomar.

DST, 2019-2023, Realization of MEMS based Dual Energy Harvester using ferroelectric and ferromagnetic thin film layered structures, Rs. 51.48 Lakhs, PI – Professor Monika Tomar

DST, 2021-2023, Sustainable route for pesticide management using nano based efficient pesticide formulation technique to enhance crop productivity., Rs. 46.77 Lakhs, PI – Dr. Poonam.

SERB, 2020-2023, Lead Optimization of Potent Multistage Antimalarials., Rs. 46.41 Lakhs, PI – Dr. Poonam.

Patents Filed/Granted

USA Patent; Patent Holder: Ashok Kumar, Hitesh Borkar, Viabhav Rao, Monika Tomar, Vinay Gupta; Patent granted in: 20/07/2020; Title: “Multi-States Nonvolatile Opto-Ferroelectric Memory Material and Process for preparing the same thereof” (Patent no. US10115456B2, 2018/10/30) (US20170206952A1, 2017/1/13).

USA Patent; Patent Holder: Steve Bradfute, Ravi Durvasula, Praksha Kempaiah, Brijesh Rathi, Poonam, Yash Gupta; Patent granted in: 29 April 2022; Title: “Calxinin Compositions and Method of Treating Viral Infections” (Application no. PCT/US22/26943).

Patent Holder: Vinay Gupta, Monika Tomar, Ayushi Paliwal and Surbhi Jain; Patent granted in: 27 August 2020; Title: “A novel highly sensitive and reliable LRSPR biosensor for detecting uric acid and fabrication thereof” (Application no. 201911006783).

Patent Holder: Vinay Gupta, Monika Tomar, Anjali Sharma and Avneet Singh; Patent granted in: 27 August 2020; Title: “Electric field assisted low power consuming conducto-metric gas sensor” (201811006329).

Patent Holder: Vinay Gupta, Monika Tomar, Anjali Sharma, Avneet Singh, Parivesh Chugh, Jaivinder Singh, Bharthy Subramanian; Patent granted in: 08 March 2019; Title: “A sensitive, selective and rapid fuel gas sensor” (Application no. 201711011941).

Patent Holder: Neelam R Yadav, Rizwana Rehsawla, Surbhi Jain, Savita Sharma, Monika Tomar, Vinay Gupta; Patent granted in: 30 May 2020; Title: “SPR based DNA biosensor for the detection of Puccinia striiformis f. tritici, causal agent of yellow rust in wheat” (Application no. TEMP/E-1/24707/2020-DEL)

Patent Holder: Rizwana Rehsawla, Neelam R. Yadav, Nidhi Dhull, Savita Sharma, Monika Tomar, Vinay Gupta; Patent granted in: 26 June 2020; Title: “Electrochemical based genosensor for the detection of Puccinia striiformis f. tritici, causal agent of yellow rust in wheat” (Application no. TEMP/E-1/30053/2020-DEL).

Patent Holder: Pradip K. Jha, Monika Tomar, Kajal Jindal, Chanchal; Patent granted in: 21 July 2023; Title: “Photoelectrochemical water splitting based biosensor for detecting uric acid in the biological fluids” (Application No.: 202311040935, Publication date: 21/7/2023).

Patent Holder: Monika Tomar, Anjali Sharma, Lokesh Rana, Reema Gupta, Shweta Sharma ; Applied on: 29 March 2023; Title: “Lithium Doped Potassium Sodium Niobate Thin Film Based Mems Pressure Sensor” (Application No.- 202311023209).

Patent Holder: Monika Tomar, Lokesh Rana, Reema Gupta, Anjali Sharma, Pradip K. Jha, Manisha Bharti, A. T. Nimal, Upendra Mittal; Applied on: 10 January 2023; Title: “Lamb Wave Resonator Device for Pressure Sensing” (Application No.- 202311002112).

Patent Applied by: Monika Tomar, Lokesh Rana, Vandana, Reema Gupta, Anjali Sharma, Manisha Bharti, A. T. Nimal, Upendra Mittal, James Ajit Raymond; Applied on: 5 June 2023;

Title “Integration of Niobium Lead Zirconium Titanate (PNZT) Thin Film Lamb Wave Acoustic Device” (Application No.- 202311036612).

Patent Applied by: A. T. Nimal, Upendra Mittal, Monika Tomar, Lokesh Rana, Reema Gupta, Anjali Sharma, Shweta Sharma, Manisha Bharti; Applied on: 8 December 2022; Title “Fabrication of Lamb Waver Acoustic Device using Potassium Sodium Niobate (KNN) thin films” (Application No.- 202211070947).

Seminars Organized

Seminar entitled, ‘Work and Education, Global Women’s Breakfast Series: Women in STEM’ by Dr. Charlotte Yates, President & Vice-Chancellor University of Guelph, Ontario, Canada , Gender on 13 February 2023.

Seminar entitled, ‘Celebrating 50 years of India-Korea diplomatic relations: India-Korea diplomatic relations’ by Mr. Lee Sang-Hwa, Public Diplomacy Ambassador, Republic of Korea, on 24 February 2023.

Seminar entitled, ‘Start-up: Women Entrepreneurship in India, Start-Up, Sustainability, Innovation and Entrepreneurship in North-East India’ by Dr. Jitendra Singh, Minister of State for Science and Technology and Department of Personnel and Training Union Cabinet, Government of India on 28 March 2023.

Seminar entitled, ‘Health Planning, Male Health and Translational Medicine in North-East India, Translational Medicine and North-East India’ by Prof. (Dr) Sujoy K Guha, Padma Shri, Prof. Emeritus, Biomedical Engineering in the School of Medical Science and Technology, IIT (Kharagpur) Currently at SGT University, Gurugram, India on 06 December 2022.

Seminar entitled, ‘Metal and Modern Medicine, Inaugural Seminar Series’ by Prof A. K. Ganguli, Deputy Director (Strategy & Planning), Prof N K Jha Chair Professor, Department of Chemistry, Professor, Department of Materials Science and Engineering, Indian Institute of Technology, Delhi, organized by Rasayanika, The Chemical Society, Department of Chemistry on 19 March 2022.

Conferences Organized

Organized IUPAC-GWB 2023 - International Conference on ‘Recent Trends in Chemistry’ on 14 February 2023, by DBT-CTEP Govt. of India, in collaboration with DRDO, Ministry of Defense, Government of India.

Organized 2nd International Conference on ‘Integrative Chemistry, Biology and Translational Medicine’, on December 2022, by Ministry of Defense, Government of India, in association with Hansraj College (DU), INMAS (DRDO), HeteroChem IrmoTech, Mayo Clinic (Florida, USA), University of Debrecen (Hungary), SGT University (Gurugram) and Institute of Eminence (DU).

Organized International Conference on ‘Start-Ups, Sustainability, Innovation and Entrepreneurship in North-Eastern India’ on 28 March 2023 by North East Regional Research and Resource Center (NERRRC), Miranda House and North Eastern Council (NEC), Shillong.

Organized National Conclave on ‘Environment and Happiness’ on 11 November 2022 by Bharat Vikas Parishad (Project Environment), in Collaboration with Centre for Himalayan Studies (University of Delhi) and Himalayan Study Circle, Miranda House.

Organized Ideation Conclave-I: ‘Prospects and Possibilities for Research Innovation, Entrepreneurship in Northeast India’ on 14 September 2022 by NERRRC, Miranda House and NEC, Shillong.

Seminar/Conference Presentations

Prof. Monika Tomar was invited for a talk on “Novel MoS₂ and GaN based Triboelectric Nanogenerators for energy harvesting application” at International Conference on Electron Microscopy & Xli Annual Meeting of Electron Microscope Society of India (Emsi-2023) organized by Department of Physics and Astrophysics, University of Delhi from 8-10 February 2023.

Dr. Hena Oak gave a Conference Oral Presentation on “Efficiency of Indian cement firms: A DEA analysis of large cement producers of PAT Cycle I and II” in the 9th International Conference on Energy and Environment Research ICEER 2022 at Porto, Portugal on 12-16 September 2022.

Dr. Rehka Kumari was invited for an e-talk on “Role of Gut Bacterial Bacteriocins to Combat Obesity by Regulating Lipogenesis” at 7th Annual International Conference of the Indian Network of Soil Contaminated Research (INSCR 2022) from November 7 -11 November 2022.

Prof. Bashabi Gupta was invited for a talk on “Role and Contribution of Indian Diaspora in the Indian Independence Movement: Travel Diaries of Subhas Chandra Bose in Europe and the Remaking of Azad Hind Fauj in Singapore at Contributions of Indian Diaspora in Freedom Struggles of India and the Rise of Global India during Amrit Kaal” at School of Economics, Takshashila Campus, Devi Ahilya University, Indore, Madhya Pradesh on 10-11 January 2023.

Prof. Monika Tomar was invited for a talk on “Recent Advances in Biosensors” at Continuous Education Programme (CEP) on *Recent Advances in Biosensing Approaches for Screening and Diagnostic Applications* organized by Defense Institute of Physiology and Allied Sciences (DIPAS), DRDO from 7-9 December 2022.

Dr. Anindita Sarkar was invited for a lecture on “The trajectory of groundwater development in Bangladesh” at an International Conference on *Energizing Agriculture and Enabling Just Energy Transitions in South Asia* organized by IWMI, SDC, IIT Gandhinagar, WRI, IRENA, ISA, GGGI, Ahmedabad University and GIZ, Gandhinagar, Gujarat on 6-8 February 2023.

Prof. Kalwati Saini was invited for a talk on “Green Synthesized advanced nano materials for removal of toxic pollutants from water” organized by CFEES, DRDO, Delhi during 19-23 September 2022.

Dr. Monika Sharma gave a Conference Oral Presentation on “A cell membrane associated protein PE_PGRS45 of Mycobacterium tuberculosis is a potential target for natural antimicrobial compounds” at 2nd International Conference on *Natural Products and Human Health* organized by Deshbandhu College, University of Delhi on 4-6 November 2022.

Dr. Hena Oak gave a Conference Oral Presentation on “Energy efficiency and energy saving by Indian fertilizer plants: Role of feedstock and ownership” in the 7th International Conference on *Energy and Environmental Science (ICEES 2023)* at Changsha, China during 6-8 January 2023.

Dr. Monika Sharma gave a Conference Oral presentation on “Mycobacterium tuberculosis Rv0335c induces host mitochondrial perturbations and apoptosis: as a molecular mimic of eukaryotic Bcl2 proteins” at *49th Annual Conference and General Body Meeting of the Indian Immunology Society IMMUNOCON-2022* held at Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, during 23-26 November 2022.

National/International MoUs Signed

Details of what MoU entails

MoU entails Exchange programme, short -term modules, summer workshops, collaborative research and global networks.

MoU with University of Guelph, Ontario, Canada (International)

MoU with Korea National Sport University, Korea (International)

Letter of Intent with Mayo Clinic, *USA* (International)

Letter of Intent with University of Maryland, College Park, *USA* (International)

MoU with Institute of Nuclear Medicine and Allied Science, *Delhi* (National)

MoU with CSIR-National Physical Laboratory, *Delhi* (National)

Number and percentage of students placed

Total 146 students were placed during the year 2022-23.

Number of Companies visited for campus recruitment

23 companies visited the campus in the year 2022-23. Some of the companies visiting the campus were DE Shaw, Accenture, KPMG Global Services, TresVista, Make my Trip, ZS Associates, ICICI, Tech Mahindra, Barclays, HCL, etc.

Extension and Outreach Activities

North East Regional Research and Resource Centre (NERRRC) has been actively engaged in empowering students, specifically from the North East Region and the community, through diverse initiatives. The Centre recently established a radio setup and offers a Radio Broadcasting Course to 30 students. Throughout 2022, NERRRC conducted skill enhancement workshops. Sikkim Project Bloom, a bamboo-based start-up initiative, focuses on sustainable products and women's empowerment. NERRRC offers research internships to 20 students in each session, providing hands-on research experience related to Northeast India.

The Centre for Environmental Studies and Disaster Management (CESDM) focuses on spreading awareness and building capacity of the college community along with outreach programmes for other stakeholders. CESDM interns have prepared the Disaster Management Plan of the college. The centre aims to continue its collaborations with various partners from government, non-government and private sector to build a sustainable and resilient community.

MH Vatavaran, the Environment Society of Miranda House, had organized various events over the year, including awareness campaigns, cleanliness drives, plantation drives and celebrated World Environment Day, World Ozone Day, World Water Day, among others. The MH Eco-Souvenir Shop was formally established within the college campus in January 2023, which offers a beautiful array of handcrafted paper products - all made from recycled paper, compost generated within the college campus, potted plants from the college nursery and various college memorabilia, all of which are available for purchase there. MH Vatavaran has continued its collaboration with WWF-India, whereby student volunteers, in collaboration with WWF- India regularly visited Sanjay Van, Delhi to work on various environmental campaigns such as butterfly habitat restoration.

Lakshita, the Enabling Society organised a three-day programme on World Braille Day including a talk on 'Representation of Disability in Literature' and a creative writing workshop; workshops on Sugamya Pustakalaya & Bookshare were also held.

NCC, Miranda House, conducted multifarious events under Azadi ka Amrit Mahotsav. Orphanage visits and donation drives were organized. Several cadets participated in Inter Directorate Sports Shooting Championship. International Yoga Day, G20 Awareness Workshop, Vriksharopan on Independence Day (under the theme-Meri Maati Mera Desh) were also celebrated by NCC, Miranda House.

NSS Miranda House continued its five different projects- Aagaz, Swachta, Saksham, Sadbhavana and Sakaar - arranging several impactful field visits to old age homes and orphanages. The society actively conducted a variety of government-led community service activities and programs throughout the year, including sanitary napkin distribution drives, Anemia and Thalassemia check-up camps, and awareness campaigns. In the realm of Health and Wellness, two comprehensive Yoga Courses were organized, complemented by two successful blood donation camps. A stress-relieving session was also organized. A notable highlight of the year was the No Shame Movement Talk Show, addressing the issue of non-consensual intimate image abuse. Furthermore, NSS Miranda House actively participated in various activities under the Azadi ka Amrit Mahotsav, Mission Life, and Clean India 2.0 initiatives, fostering close collaboration with the communities of Dhirpur, Azadpur, and Burari in North Delhi.

Unnat Bharat Abhiyan Cell organized a Career Counselling Session in Jagatpur village with the aim to assist the class X students of the Government (Sarvodaya) School in deciding and analyzing the crucial aspects of choosing their future subjects. Also, Cleanliness Drive in SKV Village, Jagatpur: a Nukkad Natak and a poster-making competition were organized in order to make the students aware of the importance of cleanliness, waste management and plastic-related issues. A Plantation drive was also organized in Burari village. Furthermore, a collection drive was organized urging the students to donate their used books, novels, NCERT, stationery or any other reading material which could be donated to needy students in villages.

Library Development

The total sanctioned Library Budget was Rs. 11,78,635/-. In the academic year 2022-2023, 1143 volumes of books were added.

Faculty Strength

Permanent: 188, Temporary: 01, Ad hoc: 11

Financial Allocation and Utilization

Grants Allocated: Rs. 825135000/-

Grants Utilised: Rs. 899840129/-

Other Significant Information

In sports, at International Level, in Asian Championships, two of MH students participated, out of which one student **Yashsavi Joshi, B.A. (Hons) English - Pistol Shooting** clinched a prestigious Gold Medal in 15th Asian Air Gun Championship held in Daegu, South Korea from 9th to 19th September 2022.

Saina Salonika was bestowed with the title of Woman International Chess Master (WIM) at an International Chess Championship held in Serbia.

At the national level, a total of 21 MH students participated in National Championships and secured an impressive haul, as three students secured first position, three students secured second position and five students secured third position. Similar feats were achieved at All India Interschool Championships, State Championship and various Delhi University Inter-College Championships

MH NCC cadets, former SGT Manasvini and JUO Amil Mariya Joy received ADG Commendation award given by Additional Director General of NCC.

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