

Curriculum Vitae

AMITAVA MANDAL

Mechanical Engineering Department
Indian Institute of Technology (ISM)
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Academic Qualification

Ph.D. in MECHANICAL ENGINEERING in 2015

Awarded from **Indian School of Mines, Dhanbad** (Now **IIT(ISM), Dhanbad**)

- Ph.D. thesis title on '**Investigation on Machining of Nimonic C-263 Super Alloy using Wire-EDM Process**'.

M. Tech. in MANUFACTURING TECHNOLOGY in 2007

Awarded from **National Institute of Technical Teachers' Training and Research, Kolkata**. Affiliated to West Bengal University of Technology (**WBUT**), Kolkata

- M. Tech thesis on experimental Study of **Micro-machining of advanced ceramic materials using Pulsed Nd:YAG Laser Beam Machine and parametric optimization**.

B.E. in MECHANICAL ENGINEERING in 2001

Awarded from **R. E. C. ROURKELA** (Now **NIT, ROURKELA**)

- B. Tech project on **Automated Material Handling Using Robotic Arm** (pick and place robotic arm)

Work Experience

- Working as **Associate Professor** and served as **Assistant Professor** in Dept. of Mechanical Engineering, **Indian Institute of Technology (Indian School of Mines), Dhanbad**, since 29th December'11
- Served as **Asst. Professor** in Dept. of Mechanical Engineering, **North Eastern Regional Institute of Science and Technology** (Deemed University), Nirjuli – 791109, Arunachal Pradesh, from 31st January'07 to 23rd December'11

Research Activities

- **Completed R & D project as Principal Investigator** on 'Development of a New Strategy to Enhance Cylindrical Wire Electrical Discharge Turning Process' funded by the Science & Engineering Research Board (SERB), Govt. of India
- **Ongoing R & D project as Principal Investigator** on 'Fabrication of different grades of tool steel by twin wire arc additive manufacturing combined with in-situ alloying' funded by the Science & Engineering Research Board (SERB), Govt. of India
- **Ongoing R & D project as Co-PI** on 'Design, development and establishment of vibration assisted wire electrical discharge turning for aerospace materials to achieve better surface integrity' funded by Defence Research & Development Laboratory (DRDL), DRDO
- **Ongoing R & D project as Co-PI** on '3D printing of overhead structures through different metal transfer strategies using wire arc additive manufacturing process' funded by the Science & Engineering Research Board (SERB), Govt. of India
- **Ongoing R & D project as Co-PI** on '3D Printing of Engineering Components through Cold Spray Technique' funded by CSIR, Govt. of India

Broad research areas

Powder mixed EDM process, Cylindrical Wire Electrical Discharge Turning, Laser Cladding & TIG cladding, Laser processing of materials, Selected Laser melting based 3D Printing, Wire Arc Additive Manufacturing

Ph.D. Guidance

- Guided Ph.D thesis of **Dr. Amit Kumar** on title '**INVESTIGATION ON THE INFLUENCE OF NANO POWDER MIXED DIELECTRIC IN EDM PROCESS**' as main guide.
- Guided Ph.D thesis of **Dr. Rashi Tyagi** on title '**SURFACE MODIFICATION BY ELECTRICAL DISCHARGE PROCESS FOR SOLID LUBRICATION**' as co-guide
- Guided Ph.D thesis of **Dr. Shakti Kumar** on title '**FABRICATION OF MMC COATINGS OVER TITANIUM SUBSTRATE THROUGH LASER CLADDING TECHNIQUE AND THEIR CHARACTERIZATION**' as main-guide
- Guided Ph.D thesis of **Dr. Piush Raj** on title '**EXPERIMENTAL INVESTIGATION OF SANDSTONE EROSION BY CONTINUOUS AND PULSED WATER JET**' as co-guide
- Guided Ph.D thesis of **Dr Biplab Kumar Roy** on title '**DEVELOPMENT OF WIRE ELECTRICAL TURNING AND ITS PERFORMANCE EVALUATION**' as sole guide
- Guided Ph.D thesis of **Dr Deepti Ranjan Sahu** on title '**POWDER MIXED ELECTRICAL DISCHARGE MACHINING: AN EXPERIMENTAL AND NUMERICAL APPROACH**' as sole guide

On-going Ph.D

Name of Student	Topic	Role
Tapas Chakraborty	Experimental investigation and parametric optimization of Electro-discharge machining of composite materials	Main guide
Kashif Hasan Kazmi	Fabrication of micro components through wire additive manufacturing process and characterization	Co-guide
Vishal Kumar	Parametric study and characterization of product made by WAAM process	Sole guide
MANCHU MOHAN KRISHNA SAI	Laser Powder Based Fusion Additive Manufacturing	Sole guide
MD SAJID HUSSAIN	Fabrication of user-defined in-situ alloys via double-wire arc additive manufacturing (D-WAAM) using machine learning (ML) approach	Sole guide
Reyazul Warsi	Additive Manufacturing of High Entropy Alloy for Bioimplant Applications.	Main guide

Administrative Activities

- **Professor-in-charge, Workshop** since October 13, 2023
- **Member** of **Dean's Advisory Council** (Student Welfare) for 2 years
- **Warden** of hostel Sapphire, IIT(ISM), Dhanbad from 01.06.2016 to 30.06.2019 & Block – E, NERIST, Nirjuli – 791109 from 01.07.2011 to 14.12.2011
- **Departmental responsibilities** like DPGC convener, M. Tech. Coordinator (Manufacturing Engg), DAC secretary, tabulator, Laboratory in-charge, member of DPGC etc.
- **Coordinator** of Mechanical Association of NERIST(MAN) from 01.04.2009 to 14.12.2011
- **Member** of **TEQIP-II** in Academic unit from 03.11.2011 to 14.12.2011 in NERIST

Conferences & Invited lectures

- Attended international conference **Engineering Manufacture (EM2024)** at **Faculty of Engineering, University of Porto, Portugal** during May 9 – 10, 2024
- Delivered as **Invited Speaker** at the National Conference on **Mechanical Engineering toward Industry 4.0** held on 1st September 2023, at Asansol Engineering College, Asansol.
- Attended international conference on **SAFE, SMART and SUSTAINABLE MINING (3SM)** by **IIT(ISM) Dhanbad** during December 16 – 18, 2023
- Attended international conference **INCOM18** at **Jadavpur University, Kolkata** during January 4 – 6, 2018
- Attended international conference **COPEN⁹** at **IIT, Bombay** during 10-12 December 2015
- Attended national conference **MENTCA 2015** at **ISM, Dhanbad** during 9-10 October 2015
- Attended international conference **ICAME-2009** at **S V N I T, Surat** during 3-5 August 2009

Professional Body Membership

- The **member** of **The Institute of Engineers** (India)
- **Life member** of Indian Society for Technical Education (**ISTE**), India
- **Life member** of **Indian Welding Society**, New Delhi, India

Personal Profile

Date of Birth	10.10.1978
Sex	Male
Nationality	Indian
Marital Status	Married
Language Known	English, Hindi, Bengali

Journal publications

1. Deepti Ranjan Sahu, **Amitava Mandal**, Rakesh Kumar, Numerical and experimental investigation into the energy distribution in powder mixed EDM, CIRP Journal of Manufacturing Science and Technology 52 (2024) 229–245, <https://doi.org/10.1016/j.cirpj.2024.05.008>
2. Vishal Kumar and **Amitava Mandal**, A critical investigation of the anisotropic behavior in the WAAM-fabricated structure, Rapid Prototyping Journal 30/5 (2024) 1023–1045, <http://dx.doi.org/10.1108/RPJ-01-2023-0005>
3. Kashif Hasan Kazmi, Mukesh Chandra, Sonu Rajak, Sumit K. Sharma, **Amitava Mandal** & Alok Kumar Das, Implementing machine learning in robotic wire arc additive manufacturing for minimizing surface roughness, International Journal of Computer Integrated Manufacturing, 2024 DOI: 10.1080/0951192X.2024.2330091
4. Ankit Singh, Vishal Kumar and **Amitava Mandal**, An experimental and numerical study on the influence of interlayer time interval in wire-arc additive manufacturing process, Proc IMechE Part C: J Mechanical Engineering Science, 2024, DOI: 10.1177/09544062241233490
5. Vishal Kumar, Suryank Dwivedi, **Amitava Mandal**, Amit Rai Dixit, Experimental investigations on the microstructural evolution and their influence on mechanical, tribological and corrosion performance of wire-arc additive manufactured SS316L structure, Volume 38, March 2024, 107673, <https://doi.org/10.1016/j.mtcomm.2023.107673>.
6. Biplab Kumar Roy, Deepak Kumar Mandal, **Amitava Mandal**, Investigation of droplet impact dynamics on textured cylindrical hydrophobic surfaces, Colloids and Surfaces A: Physicochemical and Engineering Aspects, Volume 680, 2024, 132674, <https://doi.org/10.1016/j.colsurfa.2023.132674>.
7. Monty Kumar, Anubhav Kumar Sharma, Kailash Jha and **Amitava Mandal**, (2023), Die-sink EDM texturing to fabricate hydrophilic and wear resistant surface, SURFACE ENGINEERING, 2023, VOL. 39, NO. 5, 591–599, <https://doi.org/10.1080/02670844.2023.2245604>
8. Shakti Kumar, **Amitava Mandal**, Alok Kumar Das, and Prosenjit Das, (2023) Development of a Cu/MoS₂/Ni Self-Lubricating Composite Clad through Laser Additive Approach over a Ti6Al4V Substrate and Its Characterizations, Langmuir 2023 39 (48), 17201-17215, DOI: 10.1021/acs.langmuir.3c02137
9. Monty Kumar, Mukul Anand, Kailash Jha, **Amitava Mandal**, (2023) Parametric optimization and clad characterization of composite coating prepared on Ti-6Al-4V alloy using TiB₂-Ni-Yb₂O₃ precursor powders, Materials Chemistry and Physics, Volume 308, 128248, ISSN 0254-0584, <https://doi.org/10.1016/j.matchemphys.2023.128248>.
10. Biplab Kumar Roy, Saransh Tiwari, **Amitava Mandal**, (2023) An Analysis on the Machinability Aspects of the Turning Process Using WEDM for Profile Generation, Arabian Journal for Science and Engineering, <https://doi.org/10.1007/s13369-023-08133-9>
11. Monty Kumar, Shakti Kumar, Kailash Jha, **Amitava Mandal**, (2023) Deposition of hard solid-lubricating composite coating on Ti-6Al-4V alloy with enhanced mechanical, corrosion, and electrical discharge wear properties, Surface and Coatings Technology, Volume 457, 25 March 2023. <https://doi.org/10.1016/j.surfcoat.2023.129315>
12. Manchu Mohan Krishna Sai , Shakti Kumar, **Amitava Mandal** , Mukul Anand, (2023) Sinterability of SS316, SiC, and TiN multi-material additive manufacturing via selective laser sintering, Optics & Laser Technology 167 109686, <https://doi.org/10.1016/j.optlastec.2023.109686>
13. Kashif Hasan Kazmi, Alok Kumar Das, Sumit K. Sharma, Amitava Mandal, Amarish Kumar Shukla, (2023) Wire arc additive manufacturing of ER-4043 aluminum alloy: evaluation of bead

profile, microstructure, and wear behavior, evaluation of bead profile, microstructure, and wear behavior. Weld World, Vol. 67, 2187–2200. <https://doi.org/10.1007/s40194-023-01558-8>

14. Kashif Hasan Kazmi, Sumit K. Sharma, Alok Kumar Das, **Amitava Mandal** & Amarish Shukla, Development of Wire Arc Additive Manufactured Cu-Si Alloy: Study of Microstructure and Wear Behavior, Journal of Materials Engineering and Performance (2023), <https://doi.org/10.1007/s11665-023-07972-9>
15. Tapas Chakraborty, Deepti Ranjan Sahu, **Amitava Mandal** & Bappa Acherjee (2023) Feasibility of Jatropha and Rice bran vegetable oils as sustainable EDM dielectrics, Materials and Manufacturing Processes, VOL. 38, NO. 1, 50–63, DOI: 10.1080/10426914.2022.2089891
16. Monty Kumar, Shakti Kumar, Kailash Jha & **Amitava Mandal** (2022) Composite coating by TIG cladding with different rare earth oxides, Surface Engineering, DOI: 10.1080/02670844.2022.2080901
17. Shakti Kumar, Monty Kumar, **Amitava Mandal** & Alok Das (2022) Ni-WS₂-Ti-6Al-4V self-lubricating coating on TC4 alloy by laser cladding, Surface Engineering, DOI: 10.1080/02670844.2022.2086961
18. Rashi Tyagi, Alok Kumar Das, **Amitava Mandal**, Kuldeep Kumar Sexena, Ashutosh Tripathi (2022) Hydrophobic properties and chemical state analysis of wear resistant coating prepared by electrical discharge process, Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering. May 2022. doi:10.1177/09544089221099240
19. Rashi Tyagi, Vijay Shankar Patel, Alok Kumar Das, **Amitava Mandal**, (2022) Investigation on electrical discharge coating of brass and copper powder, Transactions of the Indian Institute of Metals, <https://doi.org/10.1007/s12666-022-02650-1>
20. Shakti Kumar, **Amitava Mandal**, Alok Kumar Das (2022) The effect of process parameters and characterization for the laser cladding of cBN based composite clad over the Ti6Al4V alloy, Materials Chemistry and Physics, Vol 288, <https://doi.org/10.1016/j.matchemphys.2022.126410>.
21. Rashi Tyagi, Alok Kumar Das, **Amitava Mandal**, (2022) Wettability and Performance of Cu-MoS₂/SiC Coating Prepared by Electro-Discharge Coating Process, Transactions of the Indian Institute of Metals, Vol. 75, 1563–1572
22. Shakti Kumar, Monty Kumar, **Amitava Mandal** & Alok Das (2022) Ni-WS₂-Ti-6Al-4V self-lubricating coating on TC4 alloy by laser cladding, Surface Engineering, DOI: 10.1080/02670844.2022.2086961
23. Monty Kumar, Shakti Kumar, Kailash Jha & **Amitava Mandal** (2022) Composite coating by TIG cladding with different rare earth oxides, Surface Engineering, DOI: 10.1080/02670844.2022.2080901
24. Vishal Kumar, **Amitava Mandal**, A. K. Das, Shakti Kumar, (2021) Parametric study and characterization of wire arc additive manufactured steel structures. International Journal of Advanced Manufacturing Technology. Vol. 115, 1723–1733
25. Rashi Tyagi, Alok Kumar Das, **Amitava Mandal**, (2021) Formation of superhydrophobic surface with enhanced hardness and wear resistance by electrical discharge coating process, Tribology International, Vol. 157, 106897
26. Biplab Kumar Roy, **Amitava Mandal**, An investigation into the effect of wire inclination in Wire-Electrical Discharge Turning process of NiTi-60 shape memory alloy, (2021) Journal of Manufacturing Processes, Vol. 64, 739–749
27. Akash Naga, Ashish Kumar Srivastava, Amit Rai Dixit, **Amitava Mandal**, Alok Kumar Das, (2020) Study of surface integrity and effect of process parameters in wire electrical discharge

turning of Ti-6Al-4V, Indian Journal of Engineering & Materials Sciences, Vol. 27, April 2020, 267-276

28. Amit Kumar, **Amitava Mandal**, Amit Rai Dixit, Deepak Kumar Mandal, (2020) Quantitative analysis of bubble size and electrodes gap at different dielectric conditions in powder mixed EDM process, The International Journal of Advanced Manufacturing Technology, Vol. 107, 3065–3075
29. Deepti Ranjan Sahu, **Amitava Mandal**, (2020) Critical analysis of surface integrity parameters and dimensional accuracy in powder-mixed EDM, Materials and Manufacturing Processes, Vol. 35, Issue 4, 430–441
30. Rashi Tyagi, Nitish Kumar Mahto, Alok Kumar Das, **Amitava Mandal**, (2020) Preparation of MoS₂+Cu coating through the EDC process and its analysis, Surface Engineering, Vol. 36, Issue 1, 86–93.
31. Biplab Kumar Roy, **Amitava Mandal**, (2019) Surface integrity analysis of Nitinol-60 shape memory alloy in WEDM, Materials and Manufacturing Processes, Vol. 34, Issue 10, 1091–1102
32. Rashi Tyagi, Kshitij Pandey, Alok Kumar Das, **Amitava Mandal**, (2019) Deposition of hBN+Cu layer through electrical discharge process using green compact electrode, Materials and Manufacturing Processes, Vol. 34, Issue 9, 1035–1048
33. Amit Kumar, **Amitava Mandal**, Amit Rai Dixit, Alok Kumar Das, Saroj Kumar, Rachit Ranjan, (2019) Comparison in the performance of EDM and NPMEDM using Al₂O₃ nanopowder as an impurity in DI water dielectric, International Journal of Advanced Manufacturing Technology Vol. 100, 1327–1339
34. Shakti Kumar, **Amitava Mandal**, Alok K. Das, Amit R. Dixit, (2018) Parametric study and characterization of AlN-Ni-Ti6Al4V composite cladding on titanium alloy, Surface & Coatings Technology, Vol. 349, 37–49
35. R. Tyagi, A.K. Das, **A. Mandal**, (2018) Electrical discharge coating using WS₂ and Cu powder mixture for solid lubrication and enhanced tribological performance, Tribology International, Vol 120, 80-92
36. Amit Kumar, **Amitava Mandal**, Amit Rai Dixit, Alok Kumar Das, (2018) Performance evaluation of Al₂O₃ nano powder mixed dielectric for electric discharge machining of Inconel 825, Materials and Manufacturing Processes, Vol. 33, Issue 9, 986–995
37. Ankit Gupta, Manowar Hussain, Saurav Misra, Alok Kumar Das, **Amitava Mandal**, (2018) Processing and characterization of laser sintered hybrid B 4 C/cBN reinforced Ti-based metal matrix composite, Optics and Lasers in Engineering, Vol. 105, 159–172
38. Ved Prakash, Shubham, P. Kumar, P. K. Singh, A. K. Das, S. Chattopadhyaya, **A. Mandal**, A. R. Dixit, (2018) Surface alloying of miniature components by micro-electrical discharge process, Materials and Manufacturing Processes, Vol. 33, Issue 10, 1051–1061
39. Rabesh Kumar Singh, Amit Rai Dixit, **Amitava Mandal**, Anuj Kumar Sharma, (2017) Emerging application of nanoparticle-enriched cutting fluid in metal removal processes: a review, The Brazilian Society of Mechanical Sciences and Engineering, Vol. 39, Issue 11, 4677-4717
40. Rabesh Kumar Singh, Anuj Kumar Sharma, Amit Rai Dixit, Arun Kumar Tiwari, Alokesh Paramanik, **Amitava Mandal**, (2017) Performance evaluation of alumina-graphene hybrid nano-cutting fluid in hard turning, Journal of Cleaner Production, Vol. 162, 830-845
41. **Amitava Mandal**, Amit Rai Dixit, S. Chattopadhyaya, A. Paramanik, Sergej HLOCH, Grzegorz Królczyk, (2017) Improvement of surface integrity of Nimonic C 263 super alloy produced by WEDM through various post processing techniques, International Journal of Advanced Manufacturing Technology Vol. 93:433–443

42. Shivdayal Rao, Abhijeet Sethi, Alok Kumar Das, Niladri Mandal, Kiran P., Rizul Ghosh, A.R. Dixit, **A. Mandal**, (2017) Fibre Laser Cutting of CFRP Composites and Optimization of Process Parameters through Response Surface Methodology, Materials and Manufacturing Processes, VOL. 32, NO. 14, 1612–1621
43. D. Roy, A. K. Das, R. Saini, P. K. Singh, P. Kumar, M Hussain, **A. Mandal**, A. R. Dixit, (2017) Pulse Current Co-deposition of Ni-WS₂ Nano-composite Film for Solid Lubrication, Materials and Manufacturing Processes , Vol. 32, Issue 4, pp 365-372
44. **Amitava Mandal**, Amit Rai Dixit, Alok Kumar Das, Niladri Mandal, (2016) Modelling and Optimization of Machining Nimonic C-263 Super alloy using Multi-cut Strategy in WEDM, Materials and Manufacturing Processes, Vol. 31, Issue 7, pp 860-868
45. **Amitava Mandal**, Amit Rai Dixit, (2014) State of art in wire electrical discharge process and performance machining, Int. J. Machining and Machinability of Materials, Vol. 16, No. 1, pp 1-21

Book Chapters

1. Shakti Kumar, **Amitava Mandal**, Laser Cladding of Titanium Alloy, Laser Cladding of Metals, Springer Nature Switzerland AG, 2021, <https://doi.org/10.1007/978-3-030-53195-9>, 215-242
2. Deepti Ranjan Sahu, Amit Kumar, Biplab Kumar Roy and **Amitava Mandal**, Parametric Investigation into Alumina Nanopowder Mixed EDM of Inconel 825 Alloy Using RSM, Springer Nature Singapore Pte Ltd. 2019, K. Shanker et al. (eds.), Advances in Industrial and Production Engineering, Lecture Notes in Mechanical Engineering, https://doi.org/10.1007/978-981-13-6412-9_16
3. Chakraborty T., **Mandal A.** (2022) Bio-Dielectric as an Alternative Degradable and Sustainable Fluid in EDM: A Review. In: Kolhe M.L., Jaju S.B., Diagavane P.M. (eds) Smart Technologies for Energy, Environment and Sustainable Development, Vol 1. Springer Proceedings in Energy. Springer, Singapore. https://doi.org/10.1007/978-981-16-6875-3_60