Suman Saha

Assistant Professor

Department of Mechanical Engineering

IIT (ISM) Dhanbad, Jharkhand, India, PIN – 826004

sumansaha@iitism.ac.in / sumansaha.me@gmail.com / +91 8582870452

G Scholar h4l7EsYAAAAJ; ORCiD 0000-0002-2119-7602; Scopus 57217050963; IRINS 455171

Summary Statement

Dr. Suman Saha is an Assistant Professor of the Mechanical Engineering department of Indian Institute of Technology (Indian School of Mines) Dhanbad. Back in December 2022, he defended his PhD thesis working in the broad area of minimum quantity lubrication in high-speed micro-milling at IIT Kharagpur. His PhD research works got published in eight core manufacturing and tribological journals including JMPT, IJMS, JMP, and Wear. After completion of PhD, he joined IIT Bombay to pursue post-doctoral research on micro-machining of magnesium alloy. He was there for a few months before joining IIT (ISM) Dhanbad as a faculty in October 2023. Here he is working on the broad area of subtractive manufacturing with thrust on micro-precision machining. Parallelly, he is teaching courses at both the undergraduate and postgraduate levels, advising students and scholars, participating in the intellectual activities of the Department and Institute, and providing services to the Institute.

Educational Qualifications

Post-Doc	Jan-Oct 2023	Mechanical Engineering	IIT Bombay	-
PhD	2016 – 2022	Mechanical Engineering	IIT Kharagpur	-
M.Tech	2014 – 2016	Production Engineering	Kalyani Govt. Engineering College	9.53/10
B.Tech	2010 – 2014	Mechanical Engineering	Kalyani Govt. Engineering College	8.45/10

Scholastic Achievements

2016	Gold Medalist (University Topper) in MTech Production Engineering
2021	Student Award in WCMNM 2021 International Conference

Teaching Experiences

2023-24 Winter	UG 1st year (Sec C)	134 Students	T + L	Manufacturing Process (MEI 102)
	UG 1st year (Sec D)	133 Students	L	Manufacturing Process (MEI 102)
	3-year MTech 1st year	12 Students	T	Advances in Machining (MEC 514)*
2023-24 Summer	UG 1st year	01 Student	T + L	Manufacturing Process (MEI 102)*
2024-25 Monsoon	UG 1st year (Sec F)	134 Students	T + L	Manufacturing Process (NMES 101)
	UG 1st year (Sec H)	137 Students	T + L	Manufacturing Process (NMES 101)
	PG 1st year	38 Students	L	Machining Lab (NMEC 506)
	3-year MTech 1st year	12 Students	T	Unconventional Mfg. Process (MEC516)*
2024-25 Winter	UG 1st year (Sec C)	121 Students	T + L	Manufacturing Process (NMES 101)
	PG 1st year	23 Students	T	Micro and Precision Mfg. (NMED 541)
	PG 1st year	37 Students	L	Unconventional Mfg. Lab (NMEC 529)
	3-year MTech 2nd year	12 Students	T	Thermo-Production Processes (MED 513)

* Although I was the course instructor, these subjects were taught by multiple faculty members including me.

Departmental and Institutional Responsibilities	
From February 2024	Member of the Departmental Grievance Redressal Committee (DGRC)
From June 2024	Departmental faculty coordinator for Alumni Affairs
From July 2024	Departmental representative of the Library Advisory Committee (LAC)
From Aug 2024	Departmental representative for academic time table committee member
From September 2024	Departmental faculty coordinator for I-STEM portal
From September 2024	Member of Departmental Post Graduate Committee (DPGC)

Course Curriculum Design		
Machining Science	NMEC 501	Revamped the theory syllabus
Machining Lab	NMEC 506	Freshly designed the lab syllabus
Micro and Precision Manufacturing	NMED 541	Introduced new departmental elective theory course

Academic and Institute Duties	
13-14 Jan 2024	Visited Delhi to take weekend class for three-year MTech at IIIF Delhi
20-21 Jan 2024	Visited Delhi to take weekend class for three-year MTech at IIIF Delhi
03-04 Feb 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
25-29 Feb 2024	On duty leave to take MBA admission interview as panel member at Delhi
02-03 Mar 2024	Supervised weekend lab for three-year MTech students at Institute campus
07-10 Mar 2024	On duty leave to take MBA admission interview as panel member at Kolkata
16 Mar 2024	Field visit with UG students at Durgapur steel thermal power station
17 Mar 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
06-07 Apr 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
13-14 Apr 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
20-21 Apr 2024	Supervised weekend lab for three-year MTech students at Institute campus
15 Jul 2024	Departmental representative for verification of documents for PhD admission
23 Jul 2024	Departmental representative for verification of documents for MTech admission
26-27 Oct 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
09-10 Nov 2024	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
26 Dec 2024	Delivered an EDP lecture on Materials Handling for Refresher Training Program
18-19 Jan 2025	Visited Kolkata to take weekend class for three-year MTech at IIIF Kolkata
22 Jan 2025	Delivered an EDP lecture on Materials Handling for Refresher Training Program

Other Volunteering Experiences	
IIT Kharagpur	Volunteered four times for audience management at the convocation ceremony
IIT Kharagpur	Volunteered for five-day-night-long Smart India Hackathon national-level program

Post-Doc Supervision

Dr. Mohan Kumar
(Sept 2024 - ongoing)
(Institute post-doc)

- Sole-supervisor
- Research area – Closed micro-texture fabrication in productive way
- Current status – Initiated research works

PhD Supervision

Ankita Mistry
(July 2021 - ongoing)
(Full time scholar)

- Joint-supervisor (Supervisor – Prof. Somnath Chattopadhyaya)
- Research area – Finishing of the bi-metallic FSW joined components
- Current status – Experimentation, modelling, and data analysis ongoing

Shiv Nath Rajwar
(Jan 2024 - ongoing)
(Full time scholar)

- Sole-supervisor
- Research area – Surface integrity assessment of the machined component
- Current status – Coursework ongoing

Rajesh Kumar
(July 2024 - ongoing)
(Part time scholar)

- Sole-supervisor
- Research area – Sustainable drilling in mining industries
- Current status – Coursework ongoing

Arindam Mukherjee
(Jan 2025 - ongoing)
(Full time scholar)

- Sole-supervisor
- Research area – Cavitation-induced peening
- Current status – Coursework ongoing

MTech Supervision

Piyush Sharma
(Jun 2024 - ongoing)

- Sole-supervisor
- Research area – Table-top knurling system design for flat surface texturing

Rajpal Mahich
(Jun 2024 - ongoing)

- Sole-supervisor
- Research area – Reduction of friction-induced waste energy in machining

BTech Supervision

Sakshi Vaswani, Vislavath Sai Kiran, Jumbidi Saiteja
(Jun 2024 - ongoing)

- Sole-supervisor
- Carrying out project work in a group (of three students)
- Research area – Waste metal re-purposing through powder production

Journal Paper Publication

(Based on PhD research work)

8.	**S Saha**, PP Bandyopadhyay; Non-destructive measurement of MUCT in micro-milling using surface topography generated by bi-planer Size Effects; *International Journal of Mechanical Sciences* 275 (2024) 109332. 10.1016/j.ijmecsci.2024.109332	Q1	7.1
7.	**S Saha**, SI Ansary, S Deb, PP Bandyopadhyay; Influence of tool wear on chip-like burr formation during micro-milling, and image processing based measurement of inwardly-deflected burrs; *Wear* 530-531 (2023) 205024. 10.1016/j.wear.2023.205024	Q1	5.3
6.	**S Saha**, AS Kumar, G Malayath, S Deb, PP Bandyopadhyay; Energy balance model to predict the critical edge radius for adhesion formation with tool wear during micro-milling; *Journal of Manufacturing Processes* 93 (2023) 219-238. 10.1016/j.jmapro.2023.03.034	Q1	6.1
5.	**S Saha**, S Deb, PP Bandyopadhyay; Tool wear induced burr formation and concomitant reduction, in MQL wetting capability in micro-milling; *International Journal of Mechanical Sciences* 245 (2023) 108095. 10.1016/j.ijmecsci.2022.108095	Q1	7.1
4.	**S Saha**, S Deb, PP Bandyopadhyay; Shadow zone in MQL application and its influence on lubricant deficiency and machinability during micro-milling; *International Journal of Mechanical Sciences* 220 (2022) 107181. 10.1016/j.ijmecsci.2022.107181	Q1	7.1
3.	**S Saha**, S Deb, PP Bandyopadhyay; Precise measurement of worn-out tool diameter using cutting edge features during progressive wear analysis in micro-milling; *Wear*. 488-489 (2022) 204169. 10.1016/j.wear.2021.204169	Q1	5.3
2.	**S Saha**, S Deb, PP Bandyopadhyay; Progressive wear based tool failure analysis during dry and MQL assisted sustainable micro-milling; *International Journal of Mechanical Sciences* 212 (2021) 106844. 10.1016/j.ijmecsci.2021.106844	Q1	7.1

1.	**S Saha**, S Deb, PP Bandyopadhyay; An analytical approach to assess the variation of lubricant supply to the cutting tool during MQL assisted high speed micromilling; *Journal of Materials Processing Technology* 285 (2020) 116783. 10.1016/j.jmatprotec.2020.116783	Q1	6.7

(Based on MTech thesis work)

3.	**S Saha**, BC Paul, S Das; Productivity improvement in butt joining of thick SS plates through the usage of activated TIG welding; *SN Applied Sciences* 3 (2021) 416. 10.1007/s42452-021-04409-7	Q2	2.8
2.	**S Saha**, S Das; Effect of polarity and oxide fluxes on weld-bead geometry in activated tungsten inert gas (A-TIG) welding; *Journal of Welding and Joining* 38(4) (2020) 380-388. 10.5781/JWJ.2020.38.4.7	-	-
1.	**S Saha**, S Das; Investigation on the effect of activating flux on tungsten inert gas welding of austenitic stainless steel using AC polarity; *Indian Welding Journal* 51(2) (2018) 84-92. 10.22486/iwj.v51i2.170313	-	-

Book Chapter

1. A. Kumar, **S. Saha**; Data-driven cost estimation by Machine Learning; Machine Learning for Powder-Based Metal Additive Manufacturing; 2024, *Elsevier*, ISBN 9780443221460.
2. G. C. Behera, **S. Saha**, S. Deb; Artificial intelligence-driven modeling and optimization for machining of engineering composites; Forming and machining of polymers, ceramics, and composites; 2024, *CRC Press*, ISBN 9781032665375. 10.1201/9781032665375-13
3. **S. Saha**, S. Das; Application of activated tungsten inert gas (A-TIG) welding towards improved weld bead morphology in stainless steel specimens; Applications of new tools and techniques in manufacturing and processing; 2019, *The Institution of Engineers (India)*.

Important Conference Presentation

1. **S. Saha**, S. Deb, P. P. Bandyopadhyay; Feasibility of improving productivity through the usage of higher axial depth during MQL based sustainable micro-milling, *41st MATADOR Conference* 2021, The University of Manchester, UK.
2. **S. Saha**, S. Deb, P. P. Bandyopadhyay, Influence of deficient cutting oil supply on machining performance during minimum quantity lubrication assisted micro-milling, *4th WCMNM Conference* 2021, IIT Bombay.
3. **S. Saha**, S. Deb, P. P. Bandyopadhyay, Destructive and non-destructive approaches for precise measurement of kerf width of the micro-milling slots, *20th ISME Conference* 2021, IIT Ropar, India.
4. **S. Saha**, S. Sikdar, S. Kumar, S. Deb, P. P. Bandyopadhyay, Dependency of machining forces on process parameters during sustainable MQL based micro-milling of D2 Steel, *8th AIMTDR Conference* 2021, PSG College of Technology, India.
5. **S. Saha**, A. S. Kumar, S. Deb, P. P. Bandyopadhyay, An investigation on the top burr formation during minimum quantity lubrication (MQL) assisted micromilling of copper, *10th ICMPC Conference* 2020, GLA University, Mathura, India.
6. A. Kumar, **S. Saha**, C. S. Kumar, A. K. Nath, Laser surface re-melting of additive manufactured samples with a line focused beam, *10th ICMPC Conference* 2020, GLA University, India.

List of Referees

Prof. P. P. Bandyopadhyay	Dr. Sankha Deb	Prof. Soumitra Paul
Professor	Associate Professor	Professor and Head
Machine Tools & Machining Lab	FMS & CIM Lab	Machine Tools & Machining Lab
Mechanical Engineering dept.	Mechanical Engineering dept.	Mechanical Engineering dept.
IIT Kharagpur	IIT Kharagpur	IIT Kharagpur
Kharagpur, West Bengal	Kharagpur, West Bengal	Kharagpur, West Bengal
India, PIN – 721302	India, PIN – 721302	India, PIN – 721302
Contact: +91 3222-282950	Contact: +91 3222-281599	Contact: +91-3222-282954
ppb@mech.iitkgp.ac.in	sankha.deb@mech.iitkgp.ac.in	spaul@mech.iitkgp.ac.in