

## CURRICULUM VITAE



### **DR. CHANDAN KUMAR**

#### **Post-Doctoral Fellow (PDF)**

Department of Mechanical Engineering

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**Date of Birth:** 11<sup>th</sup> April, 1985

**Sex:** Male, **Nationality:** Indian

**Marital Status:** Married

#### **Permanent Address:**

Vill + Post - Bhuswar

Dist – Samastipur, Pin – 848211

State – Bihar, India

### **Educational Qualification**

Degree (Year)	Subject/Department	Institution/University	Marks/Grade
<b>Post-Doctoral Fellow</b> <b>(16.03.2020 to 15.03.2022)</b>	Mechanical Engineering	Indian Institute of Technology Delhi, New Delhi, India	Not Applicable
<b>Ph.D. (2012-2018)</b>	Mechanical Engineering	Indian Institute of Technology Guwahati, Assam, India	8.0/10 (Course work)
<b>M.Tech (2010-2012)</b>	Metallurgy & Materials Engineering	Indian Institute of Engineering Science and Technology (IEST), Shibpur, (Formerly Known as BESU, Shibpur), West Bengal	72.67 %
<b>B. Tech (2005- 2009)</b>	Mechanical Engineering	West Bengal University of Technology, Kolkata, West Bengal, India	7.88/10
<b>IsC. (10+2)</b>	Science Group	Bihar Intermediate Education Council, Patna, Bihar, India	65.78 %
<b>Matric (10<sup>th</sup>)</b>	General	Bihar School Examination Board, Patna, Bihar, India	64.86 %

### **Work Experience (Teaching & Research: 4 Years)**

- Worked as a **Post-Doctoral Fellow (PDF)** in Mechanical Engineering Department at Indian Institute of Technology Delhi, New Delhi, India from **16<sup>th</sup> March 2020 to 15<sup>th</sup> March 2022**.
- Worked as an **Assistant Professor** in the Department of Mechanical Engineering at Lovely Professional University, Phagwara, Punjab, India from **3<sup>rd</sup> June 2019 to 20<sup>th</sup> April 2020**.
- Worked as an **Assistant Project Engineer** on DST funded project under Department of Mechanical Engineering at **Indian Institute of Technology Guwahati, Assam, India** from **17<sup>th</sup> august 2018 to 13<sup>th</sup> Nov 2018**.
- Worked as a **Lecturer** in the Department of Mechanical Engineering at Dumkal Institute of Engineering & Technology, Dumkal, Murshidabad, West Bengal, India from **2<sup>nd</sup> August 2009 to 14<sup>th</sup> August 2010**.

## **Title of Ph.D. Thesis**

Experimental Investigation and Numerical Simulation of Fiber Laser Welding of Ti-6Al-4V Alloy and SS-316L

### **Key Findings in Ph.D. Research Work:**

- ✓ Fabrication of specially designed workpiece fixture for bead protection of Ti-6Al-4V alloy from environmental oxidation
- ✓ Exploration of parametric effect on bead features such as penetration depth, fusion zone area and size of heat affected zone and microstructural characterization by SEM analysis
- ✓ Optimization of process parameters for achieving minimal bead features by using CCRD approach of response surface methodology (RSM)
- ✓ Phase identification in the FZ by using X-ray Diffractometer (XRD) analysis and element identification by Energy Dispersive Spectroscopy (EDS) analysis
- ✓ Numerical simulation of laser beam welding process using Ansys

## **Title of ME/M.Tech Thesis**

Influence of Retained Austenite on Mechanical Properties of SAE-52100 Steel

### **Key Findings in ME/M.Tech Project Work:**

- ✓ Explored the effect of different heat treatment schedule on the amount of retained austenite in SAE-52100 steel
- ✓ Explored the effect of retained austenite on mechanical properties of SAE-52100 steel

## **Major Research Work at IIT Delhi, India (Ongoing)**

- ✓ Metallurgical characterization of laser beam weldments of SS-316L
- ✓ Metallurgical characterization of laser beam weldments of Inconel -718
- ✓ Metallurgical characterization of laser weldments of Ti-6Al-4V to Inconel-718
- ✓ Laser cladding of Ti-6Al-4V powder on SS-316L substrate for corrosion protection
- ✓ Laser cladding of TiC powder on Ti-6Al-4V substrate

### **Teaching Assistant at IIT Delhi**

- ✓ Worked as a teaching assistant for the course “Near Net-Shape Manufacturing Process”.
- ✓ Worked as a teaching assistant for the course “Advanced Welding Process”.
- ✓ Worked as a teaching assistant for the course “Manufacturing Processes”.
- ✓ Guided several undergraduate students to conduct project on Welding Processes.
- ✓ Guided several postgraduate students to conduct project on Welding Processes.
- ✓ Assisted professors in grading the course papers.

## Publications: Referred Journals

1. **Chandan Kumar**, Manas Das, C. P. Paul, B. Singh “Experimental Investigation and Metallographic Characterization of Fiber Laser Beam Welding of Ti-6Al-4V Alloy Using Response Surface Method” Optics and Lasers in Engineering, 95 (2017) 52–68.  
**Impact Factor – 4.836. DOI:** <https://doi.org/10.1016/j.optlaseng.2017.03.013>
2. **Chandan Kumar**, Manas Das, C. P. Paul, K. S. Bindra “Characteristics of Fiber Laser Weldments of Two Phases ( $\alpha+\beta$ ) Titanium Alloy” Journal of Manufacturing Processes, 35 (2018) 351-359. **Impact Factor – 5.01. DOI:** <https://doi.org/10.1016/j.jmapro.2018.08.023>
3. **Chandan Kumar**, Manas Das, C. P. Paul, K. S. Bindra “Comparison of Bead Shape, Microstructure and Mechanical Properties of Fiber Laser Beam Welding of 2 mm Thick Plates of Ti-6Al-4V Alloy” Optics and Laser Technology, 105 (2018) 306-321.  
**Impact Factor – 3.867. DOI:** <https://doi.org/10.1016/j.optlastec.2018.02.021>
4. **Chandan Kumar**, Manas Das, C. P. Paul, K. S. Bindra “Weld Quality Assessment of Fiber Laser Weldments of Ti-6Al-4V Alloy” Journal of Materials Engineering and Performance, 28 (2019) 3048-3062. **Impact Factor – 1.819.**  
**DOI:** <https://doi.org/10.1007/s11665-019-04073-4>
5. **Chandan Kumar**, Manas Das, “Exploration of Parametric Effect on Fiber Laser Weldments of SS-316L by Response Surface Method” Journal of Materials Engineering and Performance, 30 (2021) 4583–4603. **Impact Factor – 1.819.**  
**DOI:** <https://doi.org/10.1007/s11665-021-05761-w>
6. **Chandan Kumar**, Manas Das, Hitesh Vasudev “Microstructure Assessment in Laser Weldment of SS-316L” Think India Journal, 22 (2019) 485-492. **ISSN No:** 0971-1260.
7. **Chandan Kumar**, Manas Das, Hitesh Vasudev “Numerical Simulation and Microstructural Exploration in Laser Welding of Ti-6Al-4V” Think India Journal, 22 (2019) 1358-1370.  
**ISSN No:** 0971-1260
8. **Chandan Kumar**, Mans Das “Laser: A Heat Source For Welding: Critical Review” Journal of Emerging Technologies and Innovative Research, 6(1) (2019) 1830-1833.  
**ISSN No:** 2349-5162.
9. Hitesh Vasudev, **Chandan Kumar** “Wear Characteristics of Thermal Spray Nickel Based Coatings” Think India Journal, 22 (2019) 792-798. **ISSN No:** 0971-1260.
10. Hitesh Vasudev, **Chandan Kumar** “Microwave Cladding of Ni-based Powder on Stainless Steel SS-316 L” Think India Journal, 22 (2019) 799-806. **ISSN No:** 0971-1260.

## Book Chapters (International Publisher)

1. **Chandan Kumar**, Manas Das, P. Biswas “A 3-D Finite Element Analysis of Transient Temperature Profile of Laser Welded Ti-6Al-4V Alloy” Lasers Based Manufacturing, Topics in Mining, Metallurgy and Materials Engineering, (Editors: U. S. Dixit and S. N. Joshi), **Publisher- Springer, New Delhi**, (2015) 421-440. **ISBN/ISSN No.:** 978-81-322-2352-8/2364-3307  
DOI: [https://doi.org/10.1007/978-81-322-2352-8\\_21](https://doi.org/10.1007/978-81-322-2352-8_21)
2. **Chandan Kumar**, Manas Das, C. P. Paul, B. Singh “Experimental Study of Fiber Laser Weldments of 5 mm Thick Ti-6Al-4V Alloy” Application of Lasers in Manufacturing (Editors: U. S. Dixit, S. N. Joshi and J. P. Davim), **Publisher- Springer Nature Singapore**, (2019) 45-67. **ISBN/ISSN No. :** 978-981-13-0556-6/2522-5030  
DOI: [https://doi.org/10.1007/978-981-13-0556-6\\_3](https://doi.org/10.1007/978-981-13-0556-6_3)
3. **Chandan Kumar**, Manas Das “Microstructural Characterization of Ti-6Al-4V Alloy Fiber Laser Weldments” Advances in Mechanical Engineering, (Editors: B. B. Biswal, Bikash Kumar Sarkar and P. Mahanta), **Publisher- Springer Nature Singapore**, (2020) 475-486. **ISBN/ISSN No.:** 978-981-15-0124-1/2195-4364, **DOI:** [https://doi.org/10.1007/978-981-15-0124-1\\_43](https://doi.org/10.1007/978-981-15-0124-1_43)
4. **Chandan Kumar**, C P Paul, Manas Das, K. S. Bindra “Fiber Laser Welding of Ti-6Al-4V Alloy” Advanced Welding and Deforming, (Editors: Kapil Gupta and J. Paulo Davim) **Publisher- Elsevier**, (2021), **ISBN No:** 9780128220498  
DOI: <https://doi.org/10.1016/B978-0-12-822049-8.00002-5>

## Referred International Conferences

1. **Chandan Kumar**, Manas Das, Pankaj Biswas “A 3-D Finite Element Analysis of Transient Temperature Profile of Laser Welded Ti-6Al-4V Alloy” 5<sup>th</sup> International & 26<sup>th</sup> All India Manufacturing Technology, Design and Research Conference, IIT Guwahati, Assam, India, December 12–14, (2014) 52/1-52/6. **ISBN No. : 978-8-19274-612-8**
2. Anwesa Barman, **Chandan Kumar**, Manas Das “Analysis of Magnetic Field Assisted Finishing (MFAF) Process Parameters For Finishing Brass Workpiece Using Soft-Computing Technique” 5<sup>th</sup> International & 26<sup>th</sup> All India Manufacturing Technology, Design and Research Conference, IIT Guwahati, Assam, India, December 12–14, (2014) 45/1-45/6. **ISBN No. : 978-8-19274-612-8**
3. **Chandan Kumar**, Manas Das, P. Bhargava, C. P. Paul “Finite Element Method Based Numerical Simulation of Laser Beam Welded Titanium Alloy (Ti-6Al-4V)” International Conference on Precision, Meso, Micro and Nano Engineering December 10-12, (2015), IIT Bombay, Maharashtra, India.

4. **Chandan Kumar**, Manas Das, P. Bhargava, C. H. Premsingh, C. P. Paul “Effect of Process Parameters on Fiber Laser Welded Titanium Alloy” International Conference on Precision, Meso, Micro and Nano Engineering December 10-12, (2015), IIT Bombay, Maharashtra, India.
5. **Chandan Kumar**, Manas Das, C. Premsingh, C. P. Paul, B Singh “Effect of Heat Input and Defocussing Distance on The Weld Quality of Laser Beam Welded Ti-6Al-4V Alloy” 6<sup>th</sup> International & 27<sup>th</sup> All India Manufacturing Technology, Design and Research Conference, College of Engineering Pune, India, December 16–18, (2016) 68-72.  
**ISBN No. : 978-93-86256-27-0**
6. **Chandan Kumar** and Manas Das “Finite Element Method Based Transient Thermal Analysis of Laser Beam Welded Titanium (Ti-6Al-4V) Alloy” International Conference on Precision, Meso, Micro and Nano Engineering, IIT Madras, Tamilnadu, India, December 07-09, (2017) 723-726.  
**ISBN No. : 978-93-80689-28-9**
7. **Chandan Kumar** and Manas Das “Microstructural Characterization and Its Effect on Mechanical Properties of Fiber Laser Beam Welded Ti-6Al-4V Alloy” International Conference on Precision, Meso, Micro and Nano Engineering, IIT Madras, December 07-09, (2017) 539-542.  
**ISBN No. : 978-93-80689-28-9**
8. **Chandan Kumar** and Manas Das “Characterization of Microstructure in Fiber Laser Welded Ti-6Al-4V Alloy” International Conference on Recent Innovations & Developments in Mechanical Engineering, November 8–10, (2018), NIT Meghalaya, India, Paper No. IC-RIDME 18: 319.

### **Guest Talks Delivered (Invited Lectures):**

- Lecture delivered on the topic of “**Laser Beam Welding**” at Indian Institute of Technology Guwahati, Assam, India in the one-week Short Term Course on "Micro manufacturing Processes" organized by Department of Mechanical Engineering under Knowledge incubation cell for TEQIP III of CET, IIT Guwahati, on 1<sup>st</sup> December 2020.
- Lecture delivered on the topic of “**Weldability Aspect of Titanium Alloy Using Laser Heat Source**” at Indian Institute of Technology Guwahati, Assam, India in the one-week Short Term Course on "Advanced Manufacturing Technology organized by Department of Mechanical Engineering under Knowledge incubation cell for on 25<sup>th</sup> December 2020.
- Lecture delivered on the topic of “**Weldability Aspect of Titanium Alloy Using Laser Heat Source**” at School of Studies of Engineering and Technology, Guru Ghasidas Vishwavidyalaya, Bilaspur, India in the one-week AICTE-ATAL sponsored faculty development program on "Advancement in Manufacturing Technology" organized by Department of Mechanical Engineering, on 20<sup>th</sup> January 2022.

## Reviewer of International Referred Journals

1. International Journal of Precision Engineering and Manufacturing-Green Technology Published by **SPRINGER**
2. Journal of Engineering Manufacture, IMechE Part B: Published by **SAGE**.
3. Journal of Process Mechanical Engineering, IMechE Part E: Published by **SAGE**.
4. Lasers in Manufacturing and Materials Processing, Published by **SPRINGER**.

## Research Interest

- Welding Technology (**Laser, Electron Beam, Plasma Arc Welding and Hybrid Welding**) of high reactive materials like Titanium, Inconel, Magnesium, and their alloys
- Laser Cladding and Coating
- Laser Based Manufacturing
- Solid State Welding Like Linear Friction Welding, Friction Stir Welding
- Additive Manufacturing (3D Printing)
- Metallurgical Characterization and Heat Treatment Schedule
- Numerical Simulation of welding processes

## Technical Exposure

- **Software and Tools:** ANSYS, Design Expert, Auto-CAD, Origin
- **Material Characterization:** Optical Microscopy, Scanning Electron Microscopy (SEM), Energy Dispersive Spectroscopy (EDS), X-ray Diffractometer (XRD)
- Extensive experience in **Anslys<sup>®</sup>, Abaqus, Design Expert, Auto-CAD, Origin**, etc.
- Expertise in Micro-Vickers Hardness Tester, Rockwell Hardness Tester, Brinell Hardness Tester, Microstructure analysis (like Grain size, Inclusion, Phase analysis)
- Knowledge of microstructures (Pearlite, Ferrite, Austenite, Martensite, etc.) analysis and conversion of microstructure with different Heat Treatment Processes like Hardening & Tempering, Carburizing, Nitriding, Induction Hardening, Austenizing, Austempering etc.
- Knowledge of the welding quality test
- Efficient in MS-Office and Other basic computer peripherals

## Declaration

I hereby declare that all the above information is true to the best of my knowledge.