SANJAY KUMAR
Assistant Professor
Mechanical Engineering Department
J C Bose University of Science and Technology YMCA Faridabad
sanjaykpec@jcboseust.ac.in
sanjaykpec@yahoo.co.in

Mobile No. +91-7838721130

Address
House No. E-601, The Resort
BPTP, Sector 75,
Faridabad -121006,
Haryana, India.

Education Qualification:

- **Ph.D. (Mechanical Engineering)** – J.C. Bose University of Science and Technology, Faridabad (2018)
- **M.Engg. (Production Engineering)** – Panjab Engineering College (PEC), Chandigarh (2008)
- **B.Engg. (Production Engineering)** – Panjab Engineering College (PEC), Chandigarh (1999)

Research Interests

- Ultrasonic Vibration Assisted Machining & Hybrid EDM
- Cryogenic Treatment & Advanced Machining of Tool Steels
- Six Sigma, Taguchi Methods, QFD & SPC Tools
- Multi-Criteria Decision-Making (AHP, MOORA, ISM, ANP, GTA)

OBJECTIVE:

Seeking a challenging position to utilize and strengthen my skills and make full use of my potentials to be an asset for your organization.

BRIEF:

I Sanjay Kumar, working as an Assistant Professor in department of mechanical engineering atJ C Bose University of Science and Technology, YMCA Faridabad, India. I obtained my B. Engg degree from Panjab Engineering College (PEC), Chandigarh and M.Engg degree from the PEC University of Technology, Chandigarh. I have more than

15 years of teaching/industrial experience. Presently, I have submitted my PhD (submitted) from YMCAUST Faridabad. To My credit, I am having numerous papers published in reputed international journals and in national and international conferences. The subjects taught by me are Strength of material, Material Science, Value Engineering, Automatic control, Production & operational management.

In addition to this I have contributed at University level as Coordinator of Mechnext Club. It is a technical club to promote innovative ideas of student and to provide technical and financial support. I am a member of various committees for corporate life enrichment like youth festival, convocation, University Examination Automation Committee and Batch coordinator etc. I am in-charge of SOM lab and one of team member who developed SOM lab Under TEQIP.

I have guided numerous UG/PG students. I have completed one research and consultancy projects sponsored by University/private agencies in last one year. Recently, I am working on establishing a central research facility laboratory in this university. I am a life member of The Society of Technical Education and a senior member of Indian Institute of Industrial Engineering.

Area of Interest:

- Industrial Engineering:, Quality Engineering, Taguchi's Method, Six Sigma, SPC Tools,QFD
- Advanced Manufacturing Processes:, Hybrid Machining, Non-Conventional Processes
- Computer Integrated Manufacturing
- Multiple objective and multi-attribute decision making approaches: ANP, ISM, GTA,AHP, MOORA

National Conference Papers:

1. *"Just in Time Manufacturing and Inventory Management: A retrospective and literature review*" 1st IEEE National Conference on Emerging Trends in Engg & Technology on 3-4 February 2012, SBIT Sonepat Haryana.
2. *"Introduction to JIT Manufacturing; Major Components and Directions for Future Research*" 1st IEEE National Conference on Emerging Trends in Engg & Technology on 3-4 February 2012, SBIT Sonepat Haryana.
3. *"A review on process parameters optimization techniques for advanced machining processes"* National Conference on Trends and advances in Mechanical engineering, YMCA University of Science and Technology Faridabad, Haryana Oct 19-20 2012.
4. *"Managing Inventory through Transshipment – A Case Study"* 2nd International Conference on Production and Industrial Engineering CPIE-2010 NIT Jalandher, Panjab.

5. "*A vibrating system design and analysis in hybrid electrical discharge machining*" National Conference on role of science and Technology towards 'MAKE IN INDIA' YMCA University of science and Technology, Faridabad on March 05-07 2016.
6. "*A Comparative study of optimization strategies implemented in ultrasonic vibration assisted wire EDM*" 3rd National conference on Trends and Advances in Mechanical Engineering (TAME-2017) YMCA University of science and Technology, Faridabad on 16-17 2017.

International Conference Papers:

1. *"Taguchi's Technique-An Approach for Identifying Optimum Surface Roughness Performance in CNC turning Operations"* 2nd International Conference on Production and Industrial Engineering CPIE-2010 NIT Jalandher, Panjab.
2. *"Environmental benefits and production of biodiesel from waste cooking oil and from other vegetable oils*" 2nd International Conference on Production and Industrial Engineering CPIE-2010 NIT Jalandher, Panjab.
3. "*Evaluation of cutting rate for ultrasonic work piece vibration assisted Wire-EDM under varying amplitude of Vibration*" 2nd International Conference on sustainable enrgy resources, Material and Technology (ISERMAT-2019) SSN College of Engineering , Kalavakkam, Tamil Nadu on 14-15 March 2019.
4. "*A Review on Recent Innovations in Electrical Discharge Machining Process*" International Conference ICRIEAT-2016 Aurora's Scientific, Technological and Research Academy Chandrayangutta, Hyderabad.

International Journals

1. Kumar, S., Grover, S. & Walia, R.S. *Optimisation strategies in ultrasonic vibration assisted electrical discharge machining: A review*. **Int. J. Precision Technology**, 7(1), 51–84 (2017). Inderscience. [Google Scholar]
2. Kumar, S., Grover, S. & Walia, R.S. *Analyzing and modeling the performance index of ultrasonic vibration assisted EDM using graph theory and matrix approach*. **Int. J. Interact. Des. Manuf.**, 12, 225–242 (2018). Springer. [SCOPUS, SCImago, UGC]
3. Kumar, S., Grover, S. & Walia, R.S. *Effect of hybrid wire EDM conditions on generation of residual stresses in machining of HCHCr D2 tool steel under ultrasonic vibration*. **Int. J. Interact. Des. Manuf.**, 12, 1119–1137 (2018). Springer. DOI: 10.1007/s12008-018-0474-8 [SCOPUS, SCImago, UGC]
4. Kumar, S., Grover, S. & Walia, R.S. *Evaluation of Cutting Rate for Ultrasonic Work Piece Vibration Assisted Wire-EDM under Varying Amplitude of Vibration*. **Materials Science Forum**, 979, 149–156 (2020). Scientific.net. [SCOPUS, Google Scholar, UGC]
5. Krishan Kumar, O.P. Mishra & Sanjay Kumar. *Simulation of Airfoil Shape for Optimum Wing Characteristics*. **Materials Today: Proceedings**, 24, 2231–2237 (2020). Elsevier. [SCOPUS, INSPEC, CPCI, UGC]
6. Mahesh, S. & Kumar, S. *Experimental Investigation on erosion rate of cryogenic treatment of AISI D2 tool steel under wire EDM*. **Int. J. of Management, Technology and Engineering** (2018). [UGC Approved]

7. Mahesh, S. & Kumar, S. *Experimental Investigation on surface roughness of cryogenic treatment of AISI D2 tool steel under wire EDM*. **Int. J. of Management, Technology and Engineering** (2018). [UGC Approved]
8. C. Sagar, Goyal, S. & Kumar, S. *Parameter Optimization of Wire EDM using Low Frequency Vibration*. **Invertis Journal of Science & Technology**, 8(3), 119–124 (2015). [Google Scholar]
9. Bhupender Singh, Sharwan Kumar & Sanjay Kumar. *An Experimental Investigation of Surface Roughness for Vibration Assisted Workpiece in WEDM using Taguchi Method*. **Int. J. of Engineering Research-Online**, 4(3), 205–218 (2016).
10. Bhupender Singh, Sharwan Kumar & Sanjay Kumar. *An Experimental Investigation of Cutting Performance for Vibration Assisted Workpiece in WEDM Using Taguchi Method*. **SRIJAREM**, 1(4), 64–77 (2016). [Google Scholar]
11. Shrawan Kumar, Sanjay Kumar & Bhupender Singh. *Advanced Research Trends in Electrical Discharge Machining: A Review*. **Int. J. for Research & Development in Technology**, 5(7) (2016).
12. Bhupender Singh, Sanjay Kumar & Shrawan Kumar. *Electric Discharge Machining and Its Parameters: A Review*. **Journal of Advanced Research in Production and Industrial Engineering**, 3(2), (2016).
13. **Residual stresses and surface topography investigation of AISI D3 tool steel under ultrasonic vibration assisted wire-EDM**, *Int. J. Interactive Design and Manufacturing (IJIDeM)*, 16, 1417–1438 (2022). DOI: 10.1007/s12008-022-01034-5. *(IF: 2.1, UGC CARE Group II)*
14. **Ti-6Al-4V ELI Alloy: Properties, Recent Developments, and Applications**, *JoCAAA*, 31(4), 884–902 (2023). *(Scopus-indexed, CiteScore: 1.3)*
15. **Agricultural Residue Biomass Utilization for Energy Generation: A Machine Learning-Driven Approach**, *JoCAAA*, 33(5), 1218–1232 (2024). *(Scopus-indexed, CiteScore: 1.3)*
16. **Thermo-Mechanical Modeling and Residual Stress Analysis in WEDM of Ti-6Al-4V ELI Using Python-Based Computational Framework**, *Metallurgical and Materials Engineering*, 31(5), 610–622 (2025). DOI: 10.63278/mme.vi.1617. *(IF: 0.9)*

International / National Conferences

1. Kumar, S., Grover, S. & Walia, R.S. *Evaluation of Cutting Rate for Ultrasonic Work Piece Vibration Assisted Wire-EDM under Varying Amplitude of Vibration*. **ISERMAT-2019**, SSN College of Engineering, Tamil Nadu.
2. Kumar, S. & Verma, K. *Systematic framework for analysis of ultrasonic vibration perception in Hybrid EDM utilizing ISM and MICMAC approach*. **TAME-2019**, J.C. Bose UST, YMCA Faridabad.
3. Kumar, S., Mishra, O.P. & Singh, S. *Investigation of Ti alloy cutting rate under Ultrasonic Vibration Assisted Wire Cut EDM*. **TAME-2019**, J.C. Bose UST, YMCA Faridabad.
4. Kumar, S. & Goyal, S. *Review on Machinability and Uses of Titanium Alloys*. **TAME-2019**, J.C. Bose UST, YMCA Faridabad.

Research Projects and Innovations

1. Development of Ultrasonic Vibration Assisted Electrical Discharge Machining
Funded under UGC Grant (XII Plan).

- Developed hybrid EDM setup integrating ultrasonic vibration.
- Enhanced machining accuracy and material removal rate.

2. Design and Fabrication of Manually Operated Agriculture Waste Briquetting Machine: A Business Model for Self Help Groups (SHGs)
Funding Agency: Haryana State Council for Science, Innovation and Technology (HSCSIT), Directorate of Science and Technology, Haryana
Grant No.: HSCSIT/R&D/2022/68 | *Sanctioned Amount:* ₹14,00,000 | *Year:* 2021–22
Objectives:

- Design and fabricate a manually operated agricultural waste briquetting machine.
- Develop a business model for SHGs to promote waste-to-energy entrepreneurship.
- Support rural women and elderly workers while reducing stubble burning.

Outcomes:

- Working prototype developed and field-tested successfully.
- Design Patent Registered (Reg. No.: 401688-001, J.C. Bose UST).
- Business model framework established for local SHG-based production and sales.
- Promotes rural entrepreneurship, green energy, and sustainability.

3. Establishment of Central Research Facility Laboratory
Objective: Create a state-of-the-art multidisciplinary lab to support advanced R&D and collaborative innovation.

4. Scheme for Promoting Interests, Creativity and Ethics among Students (SPICES)
Role: Principal Investigator (PI)
Funding Agency: All India Council for Technical Education (AICTE)
Grant Sanctioned: ₹1,00,000 (Rupees One Lakh only)
Duration: 2021–22 to August 2022
Outcome: Conducted activities to enhance student creativity, innovation, and ethics under AICTE SPICES guidelines.

Consultancy Projects

1. **Vetting of Design and Drawing of Drive Sheave Shaft**
   Client / Agency: ASIA Resorts Limited
   Nature of Consultancy: Technical validation and design analysis of drive sheave shaft

for industrial application
Consultancy Amount: ₹50,000
Duration: 21st July 2022 – 29th July 2022
Outcome: Successfully evaluated and certified design for operational reliability and manufacturing accuracy.

---

2. **Vetting of Manufacturing of Drive Sheave Shaft**
   Client / Agency: ASIA Resorts Limited
   Nature of Consultancy: Inspection and assessment of manufacturing parameters and material conformance
   Consultancy Amount: ₹50,000
   Duration: 21st July 2022 – 29th July 2022
   Outcome: Ensured dimensional and process conformity; submitted technical report to client for implementation.

Patent / Intellectual Property

1. **Manually Operated Agriculture Waste Briquetting Machine**
   Inventors / Patentees:
   - Dr. Sanjay Kumar
   - Dr. Sanjeev Goyal
   - J.C. Bose University of Science & Technology, YMCA, Faridabad
     Design No.: 401688-001
     Date of Grant: 08 December 2023
     Granted by: The Patent Office, Government of India (Indian Designs Office under the Designs Act, 2000 and Designs Rules, 2001)
     Type: Design Patent
     Outcome / Contribution: Developed an innovative manually operated briquetting system for agricultural waste management and rural energy utilization.

Invited Talks / Expert Lectures / Conference Presentations

1. **Applications of Additive Manufacturing in Biomedical – A Review**
   10th International Symposium on Fusion of Science and Technology (ISFT–2024)
   Organizer: J.C. Bose University of Science & Technology, YMCA, Faridabad, Haryana, India
   Date: 04–08 January 2024
   Level: International
   Contribution: Presented a comprehensive review on biomedical applications of additive manufacturing and future research directions.

---

2. **Non-Conventional Machining Processes**
   Type: Expert Lecture

Organizer: Department of Mechanical Engineering, J.C. Bose University of Science & Technology, YMCA, Faridabad
Level: University
Contribution: Delivered session on hybrid machining, EDM, and ultrasonic-assisted processes for postgraduate students.

---

3. **CNC Technology: Fundamentals, Applications, and Future Trends**
   Type: Expert Lecture
   Organizer: Department of Mechanical Engineering, DPG Institute of Technology and Management, Gurugram
   Level: University
   Contribution: Conducted an expert session on modern CNC techniques and automation trends in precision manufacturing.

---

4. **CNC Technology: Fundamentals, Applications, and Future Trends**
   Type: Expert Lecture
   Organizer: Department of Mechanical Engineering, Guru Jambheshwar University (GJU), Hisar
   Level: University
   Contribution: Delivered lecture emphasizing digital manufacturing and integration of CNC systems with Industry 4.0 frameworks.

Professional and Academic Contributions

- Guided **UG/PG theses** in Manufacturing and Industrial Engineering.
- **Coordinator**, *Mechnext Club* – promoting student innovation and incubation.
- Member of committees: **Youth Festival, Convocation, University Examination Automation, and SOM Lab Development (TEQIP)**.
- Life Member, **ISTE (Indian Society for Technical Education)**.
- Senior Member, **Indian Institute of Industrial Engineering**.