AMIT MAHAJAN

Associate Professor, Mechanical Engineering Department, Khalsa College of Engineering and Technology Amritsar

University: I.K. Gujral Punjab Technical University, Jalandhar, Punjab, India

Mobile: (011) + 91-9888929632, 8198002200

Email: amitmahajan291@gmail.com

RESEARCH INTERESTS

My current research centers on the biomaterials, manufacturing, materials science, surface modification and tissue engineering.

EDUCATION

2014-2020 **Ph.D. (Mechanical Engineering) - Awarded**
I.K. Gujral Punjab Technical University, Jalandhar, Punjab
Supervised by Dr. Sarabjeet Singh Sidhu
Thesis Title: Analysis of surface modifications of metallic bioimplant after electrical discharge machining

2010-2014 **M. Tech (Thermal Engineering) – 65.77%**
Beant College of Engg. & Technology, Gurdaspur
I.K. Gujral Punjab Technical University, Jalandhar, Punjab
Thesis Title: Effect of clearance on bearing performance with variable journal speed and bearing length

2007-2010 **B. Tech (Mechanical Engineering) –75.30%**
Beant College Of Engg. & Technology, Gurdaspur
I.K. Gujral Punjab Technical University, Jalandhar, Punjab

2004-2007 **Diploma (Mechanical Engineering) -70%**
Punjab state board of technical education, Chandigarh

RESEARCH EXPERIENCE

2014-2020 Research Scholar (IKGPTU, Kapurthala); Advisor: Dr. S.S Sidhu

- A review on surface modification techniques of metallic biomaterials.

- Study of *In-vitro* biocompatibility responses on Electrically Discharge Machined surface.
- Investigation of corrosion behavior of Electrical discharge machined cobalt-chromium surface.
- Tribological analysis of Electrical discharge machined cobalt-chromium surface.

PURPOSED RESEARCH WORK

a) To synthesis the bio-favourable coating by incorporating nano-particles with suitable nonconventional technique on different compositions of Co-Cr alloy.
b) Further, to examine the surface integrity of alloy and compared the outcome with conventional EDM results.
c) To explore the *In-Vitro* and *In-Vivo* biocompatibility, corrosion and wear resistance behavior of the alloy surface after the PMEDM process.

TEACHING/ADMINISTRATIVE EXPERIENCE

2012-Present **Graduate and Postgraduate Lecturer**
Khalsa College of Engineering & Technology, India

- Lead several seminars and tutorials for undergraduates in the mechanical engineering Department.
- Demonstrated experiments and supervised practical for undergraduate as well post-graduate students of up to 30 students.
- Acted as a 'Student adviser' to undergraduates.
- Acted as project and synopsis supervisor to post-graduate students.
- Acted as examination invigilator ensuring correct procedures and processes to be followed.
- Acted as observer/flying squad/invigilator in other colleges for University exams.

April 2015- Present **Admission coordinator**
Khalsa College of Engineering and Technology, Amritsar

January 2013-Present **NSS In-charge**
Khalsa College of Engineering and Technology, Amritsar

PROFESSIONAL MEMBERSHIPS & ACHIEVMENTS

- Life time member of ISTE
- Membership of Tribology Society of India (TSI)
- Design of Hydrogen to Electrical car as a project during B.Tech
- ISTE Best Teacher Award 2020
- Khalsa Society Best Researcher Award 2020-21
- ISTE Best Project Guide Project 2015
- Reviewer of international reputed journals

PUBLICATIONS

I. IN INTERNATIONAL JOURNALS :- 11

1. Devgan, S., **Mahajan, A.** and Sidhu, S.S. (2021) "Multi-walled carbon nanotubes in powder mixed electrical discharge machining: an experimental study, state of the art and feasibility prospect". Applied Physics A 127, 806. ***(Springer, IF-2.584)***
2. **Mahajan, A.**, Devgan, S. and Sidhu, S.S. (2021) "Surface alteration of biomedical alloys by electrical discharge treatment for enhancing the electrochemical corrosion, tribological and biological performances" *Surface and Coatings Technology, 405*, 126583***. (ELSEVIER, IF- 4.158)***
3. **Mahajan, A.**, Singh, G., Devgan, S., & Sidhu, S.S. (2021). EDM performance characteristics and electrochemical corrosion analysis of Co-Cr alloy and duplex stainless steel: A comparative study. *Proceedings of the Institution of Mechanical Engineers, Part E: Journal of Process Mechanical Engineering*, *235*(4), 812-823. ***(Sage, IF-1.620)***
4. Ablyaz, T. R., Shlykov, E. S., Muratov, K. R., **Mahajan, A.**, Singh, G., Devgan, S. and Sidhu, S. S. (2020). Surface Characterization and Tribological Performance Analysis of Electric Discharge Machined Duplex Stainless Steel. Micromachines, *11*(10), pp.926. ***(MPDI, IF- 2.891)***
5. **Mahajan, A.**, Sidhu, S.S. and Devgan, S. (2020) "Examination of hemocompatibility and corrosion resistance of electrical discharge treated duplex stainless steel (DSS-2205) for biomedical applications" Applied Physics A 126, 737. ***(Springer, IF-2.584)***

6. **Mahajan, A.**, Sidhu, S.S. and Devgan, S. (2020), "MRR and surface morphological analysis of electrical-discharge-machined Co–Cr alloy" Emerging Materials Research, 9(1), pp.42-46 ***(Ice publishing, IF-1.096)***
7. **Mahajan, A.** and Sidhu, S.S., (2019), "Potential of Electrical Discharge Treatment to Enhance the In-Vitro Cytocompatibility and Tribological Performance of Co-Cr Implant" Journal of Materials Research, 34 (16), pp.2837-2847. ***(Springer, IF-2.502)***
8. **Mahajan, A.** and Sidhu, S.S., (2019), "*In-vitro* Corrosion and Hemocompatibility Evaluation of Electrical Discharge Treated Cobalt–Chromium Implant," Journal of Materials Research *34*(8), pp.1363-1370. ***(Springer, IF-2.502)***
9. **Mahajan, A.** and Sidhu, S.S., (2018), "Enhancing Biocompatibility of Co-Cr Alloy Implants via Electrical Discharge Process," Materials Technology, 33(8), pp.524-531. ***(Taylor & Francis, IF-1.820).***
10. **Mahajan, A.** and Sidhu, S.S., (2018), "Surface Modification of Metallic Biomaterials for Enhanced Functionality: A Review," Materials technology, 33(2), pp.93-105. ***(Taylor & Francis, IF-1.820).***
11. **Mahajan, A.,** Awasti, R.K., Sidhu, S.S., Devgan, S., Singh, H., (2016), "CFD investigation of clearance on pressure distribution and fluid film thickness in hydrodynamic journal bearing" International Journal of Advance Research and Innovation, 4 (2), pp. 571-575.

Manuscript Under Review-1

1. **Mahajan, A.,** Devgan. S., Kalyanasundaram., D., "Surface alteration of Cobalt-Chromium and Duplex Stainless Steel alloys for biomedical applications: A concise review" Materials and Manufacturing Processes. ***(Taylor & Francis, IF-4.616)***

II. PUBLICATIONS IN INTERNATIONAL CONFERENCES:- 2

1. **Mahajan, A.,** and Sidhu, S.S., (2018), "Enhancing Hemocompatibility of Cromium Cobalt Implant by Spark Machining," published in Electrophysical Machining in Modern Industry, IInd International scientific-practical conference of young scientists, graduate students and students, December 19–20, Russia, pp 13-17.

2. Devgan, S., **Mahajan, A.**, and Sidhu, S.S., (2017), "EDM an emerging technique for biocompatible substrates," published in Electrophysical Machining in Modern Industry, Ist International scientific-practical conference of young scientists, graduate students and students, December 12–13, Russia, pp 26-31.

III. CHAPTERS PUBLICATION IN INTERNATIONAL BOOKS:- 5

1. Singh, G, **Mahajan, A.**, Devgan, S. and Sidhu, S.S. (2022), "Comparison of Copper and Tungsten Electrodes for the Electric Discharge Machined SUS-316L" In Sustainable Machining Strategies for Better Performance (pp.197-206), Springer, Singapore.
2. Devgan, S., **Mahajan, A.**, Singh, G, Singh G. and Sidhu, S.S. (2022), "Surface Integrity of Powder Mixed Electrical Discharge Treated Substrate at High Discharge Energies" In Sustainable Machining Strategies for Better Performance (pp. 207-217), Springer, Singapore.
3. **Mahajan, A.**, Sidhu, S.S. and Devgan, S (2020) "Enhancing tribological properties of duplex stainless steel via electrical discharge treatment" In Non-Conventional Hybrid Machining Processes: Theory and Practice (pp. 135-141), CRC Press, Taylor & Francis group, London.
4. Devgan, S., Sidhu, S.S and **Mahajan, A.** (2020) "Capabilities of powder mixed-EDM using carbon nano-tubes for biomedical application" In Non-Conventional Hybrid Machining Processes: Theory and Practice (pp. 95-104), CRC Press, Taylor & Francis group, London.
5. **Mahajan, A.**, Sidhu, S.S. and Ablyaz, T., (2019) "EDM Surface Treatment: An Enhanced Biocompatible Interface" In Biomaterials in Orthopaedics and Bone Regeneration (pp. 33-40), Springer, Singapore.

IV. CONFERENCES/WEBINAR/ STC/ FDP's PARTICIPATION:- 7

1. Awasti, R.K., Singh, H., Devgan, S., Kumar, R., **Mahajan, A.,** (2012) "CFD investigation of cavitation in fluid film journal bearing system" presented in Tribology for Sustainable Development, 8th International Conference on Industrial Tribology, December 7-9, Pune, India, TSI812535.

2. **Mahajan, A.,** Awasti, R.K. and Sidhu, S.S., (2016), "Analysis of clearance on load carrying capacity and coefficient of friction in hydrodynamic journal bearing using CFD" presented in IVth International Conference on Production and Industrial Engineering, December 19-21, Jalandhar, Punjab, India.
3. **Mahajan, A.,** and Sidhu, S.S., (2019), "Investigation of corrosion performance of Co-Cr alloy and duplex stainless steel" presented in International Conference on Materials, Manufacturing and Decision Making**,** February 22-23, Gurdaspur, Punjab, India.
4. Singh, G, **Mahajan, A.**, Devgan, S. and Sidhu, S.S. (2020), "Comparison of Copper and Tungsten Electrodes for the Electric Discharge Machined SUS-316L" National e-Conference on Sustainable Machining Strategies for Better Performance, November 27-28, India.
5. Participated in 3-days "Faculty Development Program for Student Induction (FDP-SI)" September 19-21, 2019 at Khalsa College of Engg and Technology, Amritsar, Punjab,
6. Participated in Technical webinar on "Laser surface texturing and its application" August 2, 2020 at Kalasalingam academy of research and education, Tamil Nadu, India.
7. Participated in Short Term Course on "Advances in manufacturing technology", October 26-30, 2020, Beant College of engineering & technology, Gurdaspur, Punjab, India.

Amit Mahajan

Amit Mahajan