

DATA FOR ANNUAL REPORT 2019-20
(Period 1.7.2019 TO 30.6.2020)

1. Name of the department: Mechanical Engineering

2. Department Profile with infrastructure and facilities

(I) Brief introduction:

One of the basic and largest departments of the Institute, the department of Mechanical Engineering offers Ph.D. programme, two M.Tech. courses, three B.E. courses, and five Integrated Certificate Diploma courses (ICD), covering various areas of Mechanical Engineering. *NBA has accredited the academic programmes (PG and earlier the 03-year B.E.).* Entry into 1st year of 4-year undergraduate program is through JEE (main) examination and M. Tech. programs is through CCMT whereas that into ICD programs, 2nd year of 4-year undergraduate program and Ph.D. program is through the SET examination- a national level entrance examination conducted by the institute. In addition to these, scholars under NDF scheme of AICTE are also admitted into the department for carrying out Ph. D. level research. The department has well equipped laboratories enriched with state-of-the-art equipments, quality instrumentation and latest softwares.

A SLIET Mechanical Engineering Society (SMES) exists in the Department. The Society conducts various activities like lectures, student competitions and industrial visits at regular intervals.

(II) Courses offered:

POSTGRADUATE PROGRAMME

- a. Manufacturing Systems Engineering
- b. Welding and Fabrication

DEGREE PROGRAMMES

- a. **Mechanical Engineering** (2019 batch onwards)
- b. Mechanical Engineering (Manufacturing Engineering) – for old batches
- c. Mechanical Engineering (Welding Technology) – for old batches

INTEGRATED CERTIFICATE CUM DIPLOMA PROGRAMMES

- a. Diploma in Mechanical Engineering (Certificate in Foundry and Forging)
- b. Diploma in Mechanical Engineering (Certificate in Tool and Die Technology)
- c. Diploma in Mechanical Engineering (Certificate in Air-conditioning Mechanic)
- d. Diploma in Mechanical Engineering (Certificate in Welding)
- e. Diploma in Mechanical Engineering (Certificate in Auto & Farm Equipment Mechanic)

(III) Laboratories in the department:

- Industrial Automation & Mechatronics Laboratory
- TOM & Mechanics Laboratory
- SOM Laboratory
- Advance casting Laboratory

- Welding Metallurgy Laboratory
- Advanced Welding Laboratory
- Metrology Laboratory
- CAD/CAM Laboratory
- Simulation & Project Laboratory
- Thermal & IC Engine Laboratory
- Fluid Mechanics & Machinery Laboratory
- RAC & Heat Transfer Laboratory
- Auto-Farm & Automobile Laboratory
- Innovation Centre
- Industrial Engineering Laboratory
- Advanced Machining Laboratory
- Additive Manufacturing Laboratory
- Central Computing Facility

3. Research Publications

a. Web of Science indexed Journals

- i Manpreet Singh, Gagandeep Singh, Arvind Jayant, (2020), "Optimization of Turning Parameters of Titanium Chrome-moly (Ti-Cr-Mo) Alloy using Taguchi Method" Indian Journal of Engineering & Materials Sciences (In Press). (SCI/WOS).
- ii A. Bansal, J. Singh, and H. Singh, (2020), 'Erosion Behavior Of Hydrophobic Polytetrafluoroethylene (PTFE) Coatings with Different Thicknesses', *Wear*, <https://doi.org/10.1016/j.wear.2020.203340>
- iii A. Bansal, A. K. Singla, , V. Dwivedi, D. K. Goyal, J. Singla, M. K. Gupta, G. M. Krolczyk, (2020), "Influence of Cryogenic Treatment on Mechanical Performance of Friction Stir Al-Zn-Cu Alloy Weldments", *Journal of Manufacturing Processes*, Vol 56, 43–53. <https://doi:10.1016/j.jmapro.2020.04.067>.
- iv S. Singh, D. K. Goyal, P. Kumar, A. Bansal, (2020), "Laser Cladding Technique for Erosive Wear Applications: A Review", *Mater. Res. Express*, Vol 7(1), 012007. <https://doi.org/10.1088/2053-1591/ab6894>
- v A. Bansal, J. Singh, H. Singh, (2019), "Slurry Erosion Behavior of HVOF-Sprayed Wc-10Co-4cr Coated SS 316 Steel with and without PTFE Modification", *Journal of Thermal Spray Technology.*, Vol 28 (7), 1448-1465. <https://doi.org/10.1007/s11666-019-00903-y>
- vi AnilKumar, C.P. Gandhi, Xiaoyang Liu, Yi Liu, YuqingZhou, RajeshKumar, JiaweiXiang, (2020), "A novel health indicator developed using filter-based feature selection algorithm for the identification of rotor defects" *Proceedings of the Institution of Mechanical Engineers Part O Journal of Risk and Reliability*, (Sage), (ISSN: 1748-006X), First Published 12 May 2020. (SCI/WOS) <https://doi.org/10.1177/1748006X20916953>
- vii AnilKumar, YuqingZhou, C.P. Gandhi, RajeshKumar, JiaweiXiang, (2020), "Bearing defect size assessment using wavelet transform based Deep Convolutional Neural Network (DCNN)" *AEJ - Alexandria Engineering Journal (Elsevier)* (ISSN: 1110-0168), 59(2), pp 999-1012 (SCI/WOS), <https://doi.org/10.1016/j.aej.2020.03>.

- viii Anil Kumar, Rajesh Kumar,(2019), “Development of LDA Based Indicator for the Detection of Unbalance and Misalignment at Different Shaft Speeds”, *Experimental Techniques* (Springer) ISSN: 0732-8818 (SCI/WOS), <https://doi.org/10.1007/s40799-019-00349-5>
- ix Tejinder Pal Singh, Anil Kumar Singla, Jagtar Singh, Kulwant Singh, Munish Kumar Gupta, Hansong Ji, Qinghua Song, Zhanqiang Liu, Catalin I Pruncu, (2020), Abrasive wear behavior of cryogenically treated Boron Steel (30 MnCrB4) used in rotavator blades, *Materials*, IF: 2.927, Volume 13, Issue 2, Page 436, SCIE.
- x Bharat Singh, Piyush Singhal, Kuldeep K. Saxena, Ravindra K. Saxena, (2020), “Influences of Latent Heat on Temperature Field, Weld Bead Dimensions and Melting Efficiency During Welding Simulation”, *Metals and Materials International*, pp 1-19. DOI: <https://doi.org/10.1007/s12540-020-00638-4>.
- xi Rajinder Singh, Ravindra K. Saxena, Kishore Khanna, Vinay Kumar Gupta, (2020), "Creep Response of Rotating Composite Discs having Exponential, Hyperbolic, Linear and Constant Thickness Profiles" *Defence Science Journal*, 70(3):292-298
- xii Navneet Khanna, Chetan Agarwal, Munish Kumar Gupta, Qinghua Song, Anil Kumar Singla, (2020), “Sustainability and machinability improvement of Nimonic-90 using indigenously developed green hybrid machining technology”, *Journal of Cleaner production*, Vol. 263, p.p.12402
- xiii AnilKumarSingla, Jagtar Singh , Vishal S Sharma, Munish Kumar Gupta, Qinghua Song , Dariusz Rozumek , Grzegorz M Krolczyk, (2020), “Impact of Cryogenic Treatment on HCF and FCP Performance of β -Solution Treated Ti-6Al-4V ELI Biomaterial, *Materials*, vol. 13(3), p.p. 500
- xiv Munish Kumar Gupta, Mozammel Mia, Muhammad Jamil, Rupinder Singh, Anil Kumar Singla, Qinghua Song, Zhanqiang Liu, Aqib Mashood Khan, M. Azizur Rahman, Murat Sarikaya, (2020), “Machinability investigations of hardened steel with biodegradable oil-based MQL spray system”, *The International Journal of Advanced Manufacturing Technology*, Vol. 108, 735-748.
- xv Anil Kumar Singla, Jagtar Singh, and Vishal S. Sharma, (2019), “Impact of Cryogenic Treatment on Mechanical Behavior and Microstructure of Ti-6Al-4V ELI Biomaterial”, *Journal of Materials Engineering and Performance* , p.p. 5931-5945.
- xvi R.D.Gupta, P.Gupta, R.Khanna, (2020), Parametric optimization of USM parameters by Taguchi and NSGA-II for the development of μ -channels on pure titanium. *Grey Systems: Theory and Application*, ISSN: 2043-9377, Vol. 10 No. 2, pp. 173-192. <https://doi.org/10.1108/GS-01-2020-0007> (Publisher: Emerald Publishing Limited, ESCI Indexed Journal, I.F.=0.8)
- xvii U.Kumar, P. Gupta, (2020), Modeling and optimization of novel biodiesel production from non-edible oil with musa balbisiana root using hybrid response surface methodology along with african buffalo optimization. *Reac Kinet Mech Cat* (2020), ISSN: 1878-5204 (Online). <https://doi.org/10.1007/s11144-020-01807-7> (SCI, SPRINGER, I.F. 1.428, Published 17.06.2020)

b. Scopus indexed Journals

Author(s), Title, Name of Journal, Vol, Month, Yr, pp

- i. P. K.Singh, P.Saini, D.Kumar, (2020), Multi response optimization of CNC end milling of AISI H11 alloy steel for rough and finish machining using TGRA, *Materials Today: Proceedings* (Publisher: Elsevier, SCOPUS).
- ii. P. K.Singh, K. Kumar, P.Saini, (2020), Optimization of surface roughness and hole diameter accuracy in drilling of EN-31 alloy steel—A TGRA based analysis, *Materials Today: Proceedings* (Publisher: Elsevier, SCOPUS).
- iii. D.Kumar, P. K. Singh, (2019), Investigation of Tribological Behaviour of Al-4032 Based Metal Matrix Composite using Taguchi's Optimization Approach, *Materials Today: Proceedings*, 18(7), 4201-4209 (Publisher: Elsevier, SCOPUS).
- iv. D.Kumar, P. K. Singh, (2019), Microstructural and Mechanical Characterization of Al-4032 Based Metal Matrix Composites, *Materials Today: Proceedings*, 18(7), 2563-2572 (Publisher: Elsevier, SCOPUS).
- v. D.Kumar, P. K. Singh, (2019), Investigation of wear characteristics of Al-4032 based metal matrix composite using Taguchi's optimization approach, *Materials Research Express* 6 (10), 106543
- vi. Varun Sharma, A.S. Shahi, Subodh Kumar, (2019), "Influence of different filler weld wire chemistries on metallurgical and mechanical behavior of ultrahigh strength steel welded joints", *Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications*, 233 Issue 11. <https://doi.org/10.1177/1464420719844798>. (Publisher: Sage & SCI factor = 1.6).
- vii. Jastej Singh, A.S. Shahi, (2020), "Metallurgical and corrosion characterization of electron beam welded duplex stainless steel joints." *Journal of Manufacturing Processes* 50 581-595. DOI: 10.1016/j.jmapro.2020.01.009 (Publisher: Elsevier & SCI Factor = 3.462).
- viii. Dikshant Malhotra, A. S. Shahi, (2019), Weld metal composition and aging influence on metallurgical, corrosion and fatigue crack growth behavior of austenitic stainless steel welds. *Materials Research Express/ IOP Publishing Issue 6* ISSN: 20531591 (Publisher: IOP & SCI factor: 1.449).
- ix. Dikshant Malhotra, A. S. Shahi, (2020), Metallurgical, fatigue and pitting corrosion behavior of AISI 316 joints welded with Nb based stabilized steel filler. *Metallurgical and Materials Transactions A/ Springer Nature*, Issue 51, pp. 1647-1664 ISSN: 10735623 (Publisher: Springer & SCI factor: 1.985).
- x. Mohd. Majid, A. S. Shahi, (2019), Influence of intermetallic precipitation on metallurgical, mechanical and pitting behavior of AISI 2205 duplex stainless steel welded joints, *Mater. Res. Express* 6, 1265e8 <https://doi.org/10.1088/2053-1591/ab664c> (Publisher: IOP & SCI factor: 1.449).
- xi. Adarsh Prakash, A. S. Shahi, (2020), Investigations on High Temperature Wear And Metallurgical Characteristics Of Stellite 6 GTA (Gas Tungsten Arc) Weld Claddings, *Mater. Res. Express* 7, 026509 <https://doi.org/10.1088/2053-1591/ab6e2b> (Publisher: IOP & SCI factor: 1.449).
- xii. Arvind Jayant, Neeru, Anshul Agarwal, (2019), "A novel hybrid MCDM approach based on DEMATEL, AHP and TOPSIS to evaluate green suppliers" *IOP Journal of Physics*, Volume 1240, 012010. (ISSN: 1742-6596).
- xiii. Arvind Jayant, Shweta Singh, Aditya Kumar Chandan, (2019), "Sustainable supplier selection for battery manufacturing industry: A MOORA and

- WASPAS Based Approach” IOP Journal of Physics Volume 1240, 012015. (ISSN: 1742-6596)
- xiv. Janpriy Sharma, Arvind Jayant,(2019), “An Intelligent Simulation based case study of Indian Micro Small Medium Enterprise (MSME) of farm equipment Manufacturing” IOP Journal of Physics, Volume 1240, 012030. (ISSN: 1742-6596). I.F.=0.22 (SCI)
 - xv. Janpriy Sharma, Arvind Jayant, Mohit Tyagi, (2019), “Simulation based design of Production and Multi echelon supply chain network for job shop manufacturing environment: A Case Study” IOP Journal of Physics, Volume 1240, 012040. (ISSN: 1742-6596).
 - xvi. L Ahuja, D Mudgal, (2020), “High temperature corrosion performance of ceria doped Cr₃C₂-NiCr coated superalloys under actual medical waste atmosphere” *Materials Today: Proceedings*, Volume 28, Part 2, 2020, Pages 599-603
 - xvii. M Kumar, D Mudgal, L Ahuja, (2020), “Evaluation of high temperature oxidation performance of bare and coated T91 steel, *Materials Today: Proceedings*, Volume 28, Part 2, 2020, Pages 620-624.
 - xviii. Shivesh Kumar, Sunil Kumar, (2019), “Arduino Based Economic and Real Time Consumption Rate Computing”, *Universal Journal of Mechanical Engineering* Vol. 7(6), pp. 325 – 329.
 - xix. AnilKumar, Rajesh Kumar,(2020), “Signal Processing for Enhancing Impulsiveness Toward Estimating Location of Multiple Roller Defects in a Taper Roller Bearing” *ASME J Non-destructive Evaluation* (ISSN: 2572-3901), 3(1): 011003 (8 pages), <https://doi.org/10.1115/1.4045010>
 - xx. Surinder Kumar, Rajesh Kumar, (2019), Worm and wheel gears fault frequency extraction using minimum entropy deconvolution based envelope of the vibration signal, *IOP Journal of Physics*, Volume 1240: 012073 (ISSN: 1742-6588), <https://doi.org/10.1088/1742-6596/1240/1/012073>
 - xxi. Aditya Kumar, Kulwant Singh, (2020), Development of exothermic flux for enhanced penetration for submerged arc welding process, *Journal of Advanced Manufacturing Systems*, Vol. 19, No. 01, pp. 131-146.
 - xxii. Sumit Saini, Kulwant Singh, (2020), Some feasible studies for recycling of steel slag as a useful flux for submerged arc welding, *Journal of Advanced Manufacturing Systems*, Vol. 19, No. 2, pp. 277-289.
 - xxiii. SumitSaini, Shankar Singh, Kulwant Sigh, Abhishek Singh, (2019), Some studies into weldability of rice husk ash aluminium matrix composite using TIG welding, *Materials Today Proceedings*, Vol 24, Part 2, Pages 298-307.
 - xxiv. Rajinder Singh, Ravindra K. Saxena, Kishore Khanna, V. K. Gupta, (2020), “Assessment of Creep in Composite Disc having Exponential, Hyperbolic and Uniform Thickness Profiles”, *Materials Today: Proceedings*, 26(2), 1972-1976.
 - xxv. Yogeshwar Jasra, Sorabh Singhal, Rohit Upman, Ravindra K. Saxena,(2020), “Finite element simulation of Stress Corrosion cracking in Austenitic Stainless Steel using Modified Lemaitre Damage Model” *Materials Today: Proceedings*, 26(2), 2314-2322.
 - xxvi. Gurdeep Singh, Ravindra K. Saxena, Sunil Pandey, (2020), “An examination of mechanical properties of dissimilar AISI 304 stainless steel and copper weldment obtained using GTAW”, *Materials Today: Proceedings*, 26(2), 2783-2789.

- xxvii. Tarun Bindal, Ravindra K. Saxena, Sunil Pandey, (2020), "Analysis of joint overlap during friction spin welding of plastics", *Materials Today: Proceedings*, 26(2), 2798-2804.
- xxviii. Sandeep Yadav, Sorabh Singhal, Yogeshwar Jasra, Ravindra K. Saxena, (2020), "Determination of Johnson-Cook material model for weldment of mild steel", *Materials Today: Proceedings*, 28(3), 1801-1808.
- xxix. Khogesh K Rathore, Yogeshwar Jasra, Ravindra K Saxena, (2020), "Numerical simulation of fracture behavior under high-velocity impact for Aluminium alloy 6060 Target plate", *Materials Today: Proceedings*, 28(3), 1809-1815.
- xxx. Anmol Rattan, Yogeshwar Jasra, Ravindra K. Saxena, (2020), "Prediction of bending behavior for Laser Forming of Lime coated plain Carbon steel using Finite Element Method", *Materials Today: Proceedings*, 28(3), 1943-1950.
- xxxi. Nitin Mahay, R K Yadav, (2019), "An Experimental investigation into heat transfer characteristics of Cu nanofluid for automobile radiator", *IOP Journal of Physics*, Volume 1240, 012043.
- xxxii. P. K. Singh, P.Saini, K.Kumar, (2019), "Multi-response Optimization using TGRA for End Milling of AISI H11 Steel Alloy Using Carbide End Mill", *IOP Journal of Physics*, Volume 1240, Paper No. 012016.
- xxxiii. P.Gupta, A.Hooda, (2019), "Manufacturing Excellence through Total Productive Maintenance Implementation in an Indian Industry: A Case Study", *International Journal of Mechanical and Production Engineering, Research and Development*, ISSN (ONLINE): 2249-8001, Vol. 9, Issue 3, Jun 2019, pp. 1593-1604.
- xxxiv. Rahul Dev Gupta, Pardeep Gupta, (2019), "Fabrication of μ -Channels on Pure-Ti using USM and Optimization of Process Parameters", *International Journal of Recent Technology and Engineering (IJRTE)*, ISSN: 2277-3878, Vol. 8 Issue-2, July 2019, pp. 6508-6515. Publisher: Blue Eyes Intelligence Engineering and Sciences Publication; ISSN: 2277-3878.
- xxxv. Upender Dhull, Pardeep Gupta, (2020), "Hybrid Response Surface Method-African Buffalo Optimization Technique for Ultrasonic Production of Biodiesel from Waste Cooking Oil using Li doped CaO Nanocatalyst", *International Journal of Innovative Technology and Exploring Engineering (IJITEE)* ISSN: 2278-3075, Vol. 9, Issue 5, pp. 1938-1947, March 2020.
- xxxvi. Upender Dhull, Pardeep Gupta, (2020), "Composite approach of RSM-ABO for optimization of production of Ricinus Communis biodiesel using Lithium doped CaO Nanocatalyst", *International journal of advances in Science and Technology*, ISSN: 2005-4238, Vol. 29, No. 5, (2020), pp. 5555 - 5570.
- xxxvii. S. Kumar, P. Gupta, (2020), "Case Study on Business Excellence Issues of an Indian Automobile Manufacturer using SAP-LAP Framework", *International Journal on Emerging Technologies*, 11(3), pp 911–918, ISSN No. (Print): 0975-8364 ISSN No. (Online): 2249-3255.
- xxxviii. Maninder Singh, Shankar Singh, (2020), "Multi-Objective Optimization of Electro Discharge Machining of Nimonic 75 Using Taguchi Based Grey Relational Analysis", (Ref.: Ms. No. WSPC-JAMS-D-19-00077R1), In Print: *Journal of Advanced Manufacturing Systems* (ISSN (print): 0219-6867) Scopus Journal.

- xxxix. Maninder Singh, Shankar Singh, (2020), "Multi-objective optimization of Electrical Discharge Machining of Nimonic 75 using Teaching Learning Based Optimization (TLBO) Algorithm, Materials Today: Proceedings (Elsevier) Scopus Journal, Vol. 24 (Part 2), 576–584.
- xl. Anmol. S. Verma, Shankar Singh, A. Singh (2020), "An Exploratory Investigation and Optimization of Taper Cutting Operation with Wire Electro Discharge Machining", Materials Today: Proceedings (Elsevier) Scopus Journal, Vol. 24 (Part 2), 388–397.

c. Other peer reviewed Journals

- i. Anshul Agarwal, Arvind Jayant (2019) ""Support Vector Machine Model for Demand Forecasting in an Automobile parts industry: A Case Study" International Research Journal of Science, Engineering and Technology, Volume 9(2), Pp 33-49. ISSN 2454-3195, ([UGC-47932](#))
- ii. Anshul Agarwal, Arvind Jayant, (2019), "Application of Machine Learning Techniques in Supply Chain Management" International Research Journal of Management Sciences & Technology, Vol.10, Issue 6, Pp 29-49. DOI: <https://doi.org/10.32804/IRJMST>, ISSN: 2250 – 1959 ([UGC-47959](#))
- iii. Vivek Gupta, Arvind Jayant, (2019), "Evaluating Low Carbon Supply Chain Practices in India using Fuzzy Tool based Importance and Performance Analysis" Journal of Energy, Environment & Carbon Credits Volume 9(1), pp 1-11. ISSN: 2249-8621. (UGC J.No.47107)
- iv. ParthaSarathi Mallick, Shankar Singh, (2019), "Electro Discharge Drilling (EDD) of Rice Husk Ash Reinforced Aluminium Matrix Composite Using Different Electrode Shapes", Journal of Emerging Technologies and Innovative Research (ISSN: 2349-5162), Vol. 6 (5), Pages 90-97.
- v. Ankit Bhati, Shankar Singh, (2019), "Some studies into Slicing of Titanium alloy using Wire Electro-Discharge Machining Process", Journal of Emerging Technologies and Innovative Research (ISSN: 2349-5162), Vol. 6 (5), Pages 98-104.

d. Full Paper in International conferences

- i. A. S. Shahi., Dikshant Malhotra,(2020),"Effect of dual phase stabilization via varying Ti/Nb ratios on the pitting behavior of AISI 347 welds", Characterization of Minerals, Metals and Materials 2020/ Springer International publishing, 2020, Online ISSN: 978-3-030-36628-5 TMS 2020 proceedings (Scopus)
- ii. Anuj Bansal, Jagtar Singh, Harpreet Singh, (2019), "Investigating Slurry Erosion Behavior of A Hydro-Machinery Steel Under Various Impingement Variables" presented in International Conference on Advancements and Futuristic Trends in Mechanical and Materials Engineering (AFTMME-2019) organised by IIT, Ropar and SOMME during 5 to 7 December 2019.
- iii. L. Ahuja, D. Mudgal, (2019), High temperature corrosion performance of ceria doped Cr₃C₂-NiCr coated superalloys under actual medical waste atmosphere, IMMT2019, organised by BITS, Pilani, Dubai Campus, 20th -

- 25th Nov. 2019. Materials Today: Proceedings, Volume 28, Part 2, 2020, Pages 599-603
- xli. Upender Dhull, Pardeep Gupta, (2019), "Performance and Emission testing of Diesel Engine using blends of Biodiesel from Castor Oil and Neem Oil prepared using Lithium Doped CaO Nano-Catalyst", Springer Proceeding Lecture Notes in Mechanical Engineering, 4th International conference on "Emerging Trends in Mechanical and Industrial Engineering" organised by Northcap University Gurgaon from 10-11 October, 2019.
 - xlii. Pardeep Gupta, Ankesh Mittal, (2020), "Identifying the most influencing success factors of TQM implementation in manufacturing industries using Analytical Hierarchy Process", Proceedings of the International Conference on Industrial Engineering and Operations Management Dubai, UAE, March 10-12, ISSN: 2169-8767 ISBN: 978-1-5323-5952-1, pp. 481-494.
 - xliii. Ankesh Mittal, Pardeep Gupta, Manjot Singh, (2020), "To Investigate the Relationship between TQM Enablers Applicable In Indian Engineering Educational Institutes", Proceedings of the International Conference on Industrial Engineering and Operations Management Dubai, UAE, March 10-12, ISSN: 2169-8767 ISBN: 978-1-5323-5952-1, pp. 541-552.

4. Other publications

a. Book Chapters

Author(s). Title of chapter. Name of Book, Publisher. Year. ISBN no

- i. Arvind Jayant, Janpriy Sharma, (2019), Modelling, Simulation and Optimization of Product Flow in a Multi-products Manufacturing Unit: A Case Study. In the book titled "Operations Management and Systems Engineering", pp 185-214, April 2019. Online ISBN: 978-981-13-6476-1. Springer, Singapore.
- ii. Jayant Arvind, Neeru, (2020), "Decision Support Framework for Smart Implementation of Green Supply Chain Management Practices". In: Patnaik S. (eds) New Paradigm of Industry 4.0. Studies in Big Data, vol 64. Springer, Cham (Scopus).
- iii. Shweta Singh, Arvind Jayant, Tanmay Walke, (2019), "A robust hybrid multi-criteria decision-making approach for selection of third-party reverse logistics service provider" Lecture Notes in Mechanical Engineering (Springer Publication). ISSN: 2195-4356. (In Press)
- iv. Anshul Agarwal, Arvind Jayant, Vaibhav Gupta, (2019), "Application of Machine Learning Technique for demand forecasting: A Case Study of manufacturing industry" Lecture Notes in Mechanical Engineering (Springer Publication). ISSN: 2195-4356. (In Press)
- v. Vivek Gupta, Arvind Jayant, (2019), "Low Carbon Supply Chain Management: A Fuzzy-DEMATEL Analysis of Some Practical Issues of Indian Manufacturing Industries" Lecture Notes in Mechanical Engineering (Springer Publication). ISSN: 2195-4356. In Press
- vi. A. Bansal, J. Singla, S. Pandey, P. Raj, (2020), "Design and Development of High-Velocity Submerged Water Jet Cavitation Erosion Test Rig" In: Sharma V., Dixit U., Sørby K., Bhardwaj A., Trehan R. (eds) Manufacturing Engineering. Lecture Notes on Multidisciplinary Industrial Engineering.

- Springer, Singapore. ISBN: 978-981-15-4619-8, pp. 85-93. (Scopus-indexed).
- vii. A. Singh, A. Bansal, J. Singh, A. K. Singla, (2020), "Effect of Cryogenic Treatment on Mechanical and Metallurgical Properties of SS410" In: Sharma V., Dixit U., Sørby K., Bhardwaj A., Trehan R. (eds) Manufacturing Engineering. Lecture Notes on Multidisciplinary Industrial Engineering. Springer, Singapore, ISBN: 978-981-15-4619-8, pp. 221-229. (Scopus-indexed).
 - viii. A. Saxena, R. K. Saxena, (2020), Thermomechanical Analysis of Al-7075 to Predict Residual Stresses by Using 3D Finite Element Simulation. In: Biswal B., Sarkar B., Mahanta P. (eds) Advances in Mechanical Engineering. Lecture Notes in Mechanical Engineering. Springer, Singapore, pp 281-293. (Book Chapter).
 - ix. G. Singh, R. K. Saxena, S. Pandey, (2020), Finite Element Based Prediction of Transient Temperature Distribution, Heat Affected Zone and Residual Stresses in AISI 304 Stainless Steel Weldment. In: Biswal B., Sarkar B., Mahanta P. (eds) Advances in Mechanical Engineering. Lecture Notes in Mechanical Engineering. Springer, Singapore, pp 307-320. (Book Chapter)

5. Expert lectures organised

- i. An expert lecture on "Computational Fluid Dynamics" was delivered by Dr. Arun K. Saha, Department of Mechanical Engineering, IIT Kanpur on 17th July 2019.
- ii. An expert lecture on "Automation in Welding Technology" was delivered by Er. Harpreet Singh Bhui, Director, Brahm Engineers, Mohali on 16th October 2019.
- iii. An expert talk on "3-D printing and Design Technology" was delivered by Er. Dakshina Ranjan, Vice President, Kangaro Industries, Ludhiana on 9th December 2019.
- iv. An expert lecture on "Application of Additive Manufacturing" was delivered by Dr. Sanat Agarwal, NIT, Uttarakhand on 10th December 2019.
- v. An expert lecture on "Industrial Applications of Rapid Prototyping and Additive Manufacturing" was delivered by Er. A.P. Singh, GM, CTR, Ludhiana on 13th December 2019.
- vi. An Expert Lecture on "Overview of Tyre Technology" was delivered by Sh. Ravi Shanker of Ralson India Ltd., Ludhiana in the Mechanical Engineering Department on 7th February 2020 for the students of ICD, BE and M.Tech. Programme. The event was Co-ordinated by Dr. Rakesh Kumar, Associate Professor, Mechanical engineering Department.

6. Research projects awarded during the year

S No	Name of Faculty (Principal Investigator)	Name of the Funding agency	Title of the Project	Sanctioned order no.	Sanctioned date	Amount Received (In figures)	Amount received (in words)
i	Vivek Kumar	TEQIP-III	Development of smart system for monitoring surface roughness in turning process	Dean R&C/2020/110	5/2/2020	Rs 2,10,000	Rupees two lakh and ten thousand

7. Patents Filed/granted/published/licensed:

S No	Name of faculty	Title of Patent	Application No	Date of Filing/granting/publishing/licensing
i.	Nitin Yadav, Rajesh Kumar	Multi point tapper for pressurizing piezoelectric Element	325941-001	15.01.2020
ii.	Shankar Singh N.V. Satpute L. M. Jugulkar S. M. Sawant	Regenerative Electromagnetic Shock Absorber	4077/MUM/2015	Date of filing: 28 October 2015, Published: 5 May 2017 Under Examination: 26/06/2018 Date of Issue of FER (First Examination Report): 14/01/2020 The response to FER (First Examination Report) for Patent Application 4077/MUM/2015 has been submitted to the Indian Patent Office on 30th June 2020.

8. Training Programmes held for teachers and Staff

S No	Name of the program	Duration	No of participants	Sponsoring Agency if any	Remarks
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i.	Material Characterization & Analytical Techniques for Research Applications (MCATRA-2019)	1-5 July, 2019	More than 50	TEQIP-III	
ii.	3D printing & Design	09-13 December, 2019	49	ATAL-AICTE	

9. Training Programmes held for students

S No	Name of the program	Duration	No of participants	Sponsoring Agency if any	Remarks
i.	Industrial Quality Tools	16-17 th October, 2019	60	TEQIP-III	
ii.	Preparation of Business Plan and Detailed Project Report	02-03 March, 2020	40	SLIET, Longowal	
iii.	Industrial Motivational Campaign for youth	19-20 February, 2020	100	TEQIP-III	

10. Any other salient achievements by faculty /staff/Research scholars/students:

a. Awards/Prizes won by Students and Faculty

- i. Mr. Jastej Singh, Ph.D. Research Scholar (Regd. No. PME/1503), working under supervision of Dr. A.S. Shahi, (Professor, Department of Mechanical Engineering) was conferred with the **“YOUNG SCIENTIST AWARD”** by the Punjab Academy of Sciences, Patiala, Punjab, in Section-D (Engineering Sciences) for Year 2019 at 23rd Punjab Science Congress held at Sant Longowal Institute of Engineering & Technology (SLIET), Longowal, Punjab (India) during February 7-9, 2020. The award carries a Medal, a Certificate of merit and Cash prize of ₹7500/-.
- ii. Mr. Jastej Singh, Ph.D. Research Scholar (Regd. No. PME/1503), working under supervision of Dr. A.S. Shahi, (Professor, Department of Mechanical Engineering) was conferred with the **“SLIET Quality Publication Award (SQPA)”** for the research paper entitled *“Metallurgical and corrosion characterization of electron beam welded duplex stainless steel joints”* published in the *“Journal of Manufacturing Processes”* on 26th January 2020 at Sant Longowal Institute of Engineering and Technology (SLIET),

Longowal Punjab. The award carries a Certificate of appreciation along with Cash prize of ₹5000/-.

- iii. Mr. Ankesh Mittal PhD. Research Scholar working under supervision of Dr. Pardeep Guptawon the Best Track Paper award for his paper entitled "To Investigate the Relationship between TQM Enablers Applicable in Indian Engineering Educational Institutes" and included in Proceedings of the International Conference on Industrial Engineering and Operations Management, Dubai, UAE, March 10-12, ISSN: 2169-8767 ISBN: 978-1-5323-5952-1, pp. 541-552.
- iv. SLIET team "Green Rangers 2019" under guidance of Dr Shankar Singh, Professor (Mechanical) as Faculty Advisor participated in 10th season of "Efficycle 2019" - a student competition of Society of Automotive Engineers Northern India section (SAE-NIS) held at Lovely Professional University (LPU), Jalandhar during 01-05th October, 2019 and Won Gradient Simulator Award (Advance Category) and Utility Demonstration Award (Advance Category), along with a cash prize.



Fig.: Team "Green Rangers" with Director, SLIET

- v. SLIET team 'Junkyard Warriors 2020' under guidance of Dr Shankar Singh, Professor (Mechanical) as Faculty Advisor, participated in 13th season of BAJA SAE INDIA 2020 for display of design and development of an All-

Terrain Vehicle (ATV), organized at Chitkara University, Chandigarh from 5-9th March, 2020 and bagged 'Pride of Punjab' award.



Fig.: Winning Team “Junkyard Warriors” with Director, SLIET

- vi. SLIET Team ‘JUGGERNAUTS’ under guidance of Dr Shankar Singh, Professor (Mechanical) as Faculty Advisor participated in 7th Go Kart Design Challenge (GKDC) Season, 2019-20, at Kari Motor Speedway, Coimbatore, Tamil Nadu during February 10-14, 2020.



Fig.: Team ‘Juggernauts’ with Faculty Advisor

b. Any other

- i. Sunil Kumar AP, Chaired session in International Conference on Innovative Engineering Design – 2020 (ICOIED 2020), 18-20 January 2020.
- ii. A. S. Shahi, Professor (ME) delivered a series of expert lectures in a one-day workshop/seminar on *Improving weld quality and productivity* organized by Chamber of Commercial & Industrial undertakings (CICU) on 09/11/2019 at Focal point Ludhiana, Punjab-India.
- iii. A. S. Shahi delivered two expert lectures on the topics ‘Weldability issues of stainless steels’ and ‘Material Characterization techniques for materials used for critical applications’ as a resource person in a one week short term course on “Advancements in Manufacturing and Material Processing – AMMP, held from January 2-6, 2020 at NIT Jalandhar.
- iv. P. K. Singh, Professor (Mech. Engg.), “Yield Estimation in Manufacture of Engineering Assembly using Simulation” Keynote address delivered on 23.09.2019 in TEQIP-III Sponsored Workshop on *Advanced Materials, Manufacturing and Measurements*, 23-27 September 2019, by Department of Mechanical Engineering, NIT Agartala.
- v. Arvind Jayant, Expert Talk on “Strategic Decision Making in Manufacturing Environment” in TEQIP-III Sponsored STTP on “Design and Implementation Issues in Supply Chain Management” during October 3-7, 2019 at NIT Jalandhar.
- vi. Arvind Jayant, Expert Talk on “Bullwhip Effect in Supply Chain Management” in TEQIP-III Sponsored STTP on “Design and Implementation Issues in Supply Chain Management” during October 3-7, 2019 at NIT Jalandhar.
- vii. Arvind Jayant, Expert Talk on “MCDM Analysis in Research” in FDP on “Research in Modern Era” organized by J. C. Bose University of Science and Technology, YMCA, Faridabad, Haryana during June 01-05, 2020.
- viii. Mechanical Department developed a design realizing concept for conversion of a normal wash basin into leg press wash basin. The same is functional in washroom on the ground floor in the department.



Fig.:- Foot Operated Wash Basin

- ix. The department developed an automatic sanitizer spray facility and the same is installed in corridor of its ground floor.



Fig. :- Automatic Sanitizer Spray Facility