MECH TIMES

An insite of Mechanical engineer's world

Department of Mechanical Engineering

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Contents

Vision of Department

The department shall strive to act as a podium for the development and transfer of technical competence in academics, impart appropriate skills, entrepreneurship, and research in the field of Mechanical Engineering to meet the changing need of society.

Mission of Department

1. To provide programmes from skill development to the research level.
2. To impart technical education and training in innovative state of-the-art technology in the field of mechanical engineering.
3. To disseminate knowledge and information by organizing seminars/ workshops/short-term courses in a planned manner
4. To provide extension services to rural society, industry professionals, institutions of research, and higher learning in the field of mechanical engineering.
5. To interact with the industry, educational and research organizations, and alumni in the fields of curriculum development, training, and research for sustainable social development and changing needs of society.

Faculty Mechanical Department

Additive Manufacturing Workshop

Shastri Indo-Canadian Institute (SICI) sponsored two-day workshop on Additive Manufacturing (AM) was conducted by Department of Mechanical Engineering, SLIET, Longowal on 30 – 31st January 2021. The workshop was inaugurated by Honorable Director SLIET, Prof. Shailendra Jain, in his address he appreciated the collaborations with SICI and motivated students to show more participation. Director of Shastri Indo Canadian Institute, Dr. Prachi Kaul encouraged the young faculty and students to participate in various schemes. The welcome address was given by Prof. Surita Maini, Institute Member representative SICI. Dean (Acad) Prof. A.S. Arora congratulated coordinator and students and asked the students to apply for various schemes of SICI. Mrs. Ankita Omer, Workshop Co-Ordinator, began the workshop with a brief introduction to additive manufacturing.

Approximately 100 students registered for the workshop and benefitted from it. The workshop comprised of six 1.5-hour sessions. The first day began with an introductory session, delivered by Prof. R. Ranganathan, Coimbatore Institute of Technology, Coimbatore. In this session participants learned about the current applications of AM. The next session was conducted by Dr. Sunil Kumar, SLIET; in this session Dr. Sunil talked about the basics of computer aided design (CAD) and its applications in AM. Third session comprised of a live demonstration of 3-D printing by Mr. Rajkumar, Applications Engineer from Adroitec Information Systems Pvt. Ltd.

On the second day, Mr. Rajkumar started the session by discussing about scanning techniques. He also briefed the participants on various slicing techniques used in AM. Mr. Vinod Pandey, Regional Sales Manager, Adroitec Information Systems Pvt. Ltd. gave techno-commercial overview of AM technology in current scenario.
The workshop was concluded by Mrs. Ankita Omer with a brief valedictory session in which participants shared their views and experiences of the workshop. The valedictory session ended with kind words from Prof. S. Maini, SLIET Institute representative, SICI and Dr. Indraj Singh, HoD (ME).

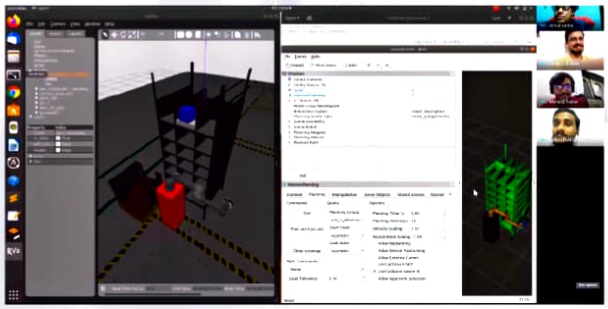
Technical Session chaired/ Expert Lectures Delivered

1. ***Dr. Shankar Singh***, Professor acted as Session chair (online mode) of Technical Session in 7th National Conference on Advancements in Manufacturing Technology (NCAMT 2021) organized by Department of Mechanical Engineering, National Institute of Technical Teachers Training and Research (NITTTR) Chandigarh from March 25-26, 2021.
2. ***Er. Surender Kumar***, Assistant Professor Mechanical Engineering Department have taken online classes of Elementary Mechanical Engineering for UG students of NIT Uttarakhand in March 2021.
3. ***Dr Vivek Kumar***, Assistant Professor, Mechanical Engineering Department delivered an Expert Lecture in series of Lecture on "Recent Trends in Engineering" organized by Mechanical Engineering Department, FET, MJP Rohilkhand University, Bareilly during 05-06 March, 2021.
4. ***Dr Vivek Kumar***, Assistant Professor, Mechanical Engineering Department delivered Lectures for the course Elementary Mechanical Engineering to UG students of NIT Uttarakhand during 3rd -5th March 2021.
5. ***Dr Vivek Kuma***r, Assistant Professor, Mechanical Engineering Department delivered an expert talk in one week FDP on "Mechanical Engineering- Emerging Technologies (MEET-2021) organized by Department of Mechanical Engineering, BIT Sindri during May 24th to 29th 2021.

ENDEAVOUR TIMELINE

(JAN 2021 – JUNE 2021)

e-Yantra 2020



The SLIET team comprising of Princu Singh (GME-18), Mahesh Yadav (GEE-18), Shivotkarsh Raj (GEE-18), Vimal Kumar Verma (GEC-18) under the guidance of Dr. Amrik Singh (Associate Proffesor Department of Mechanical Engineering) participated in e-Yantra 2020. Task 0 was based on installation and essential learning of ROS.

The theme for our team was Vargi Bots. The problem statement was "to stimulate a Warehouse Management System using two UR5 arms which quickly pick and sort incoming ordered of packages based on their priority through an IoT protocol while updating a dashboard and database in real-time to provide the timely notification."

There were in total six tasks, and resources were provided with a question which could help you in getting the mutual understanding of the task. The problem statement had subdivisions wherein they needed to

- First to identify the packages on a shelf
- Second to update inventory tasks in the warehouse.
- The third warehouse should receive orders from customers via MQTT.
- The fourth was a simulation of a bot on a gazebo to pick up boxes from a shelf and place it in a bin.
- Fifth, sending notification to customer saying the order has been dispatched using IoT(HTTP)
- Sixth to control the conveyor to take the package to the second robotic arm for sorting
- Seventh to send an email notification that the order has been shipped
- Eighth to update the warehouse management spreadsheet
- Ninth to use the second arm to sort the packages based on priority
- Tenth to use a spreadsheet as a JSON endpoint to update customer dashboards developed by the teams to present various data in real-time.

All these challenges were presented in the form of various tasks, and the final job was combining all these tasks as one solution. After the sixth round, an interview session was held.

Endless nights without sleep, days and days of testing the codes, thousands of trials were performed, an abundance of time was invested, ideation of how to make a correct program, working in harmony, and their positive attitude made them finish this onerous path. As it is well said, difficult roads lead to a beautiful destination, so does this one too. Our team was ranked 5th among 427 teams that participated, and they all got eight weeks internship with a stipend from IIT Bombay. Self-belief and hard work will always lead you to success, and our team is a living example of the same.

Recruitment 2020-2021

Endeavour has been recruiting new talented faces since 2015. This year's process was different since everything was online, but the response was overwhelming. With over 326 registrations seven days of day and night interviews and 15 days workshop team recruited 50 students who had desire to learn and determination to succeed

CONJOIN 2021

Three days of virtual alumni meet was organized from 28 June 2021- 30 June 2021. The college passed out members were invited as guests in the meet. The main motive was to inspire the new generation of SLIET and Endeavour with experience and wisdom.

Mr. Kumar Pranshu, Mr. Md. Shanur Rehman, Mr. Shri Hari Bhardwaj, Mr. Yashovardhan Sharma, Mr. Kalyan, Mr. Harsh Sharma, Mr. Rahul, Mr. Ashwini, and Mr. Dilkush were our guests for the evenings. The distances seem to have vanished, and it felt like we were sitting in a classroom together.

7 Holes In The International Space Station

By G Sai Harsh, GME-20

It is hardly debatable to state that the International Space Station is one of the most remarkable feats of mankind and an absolute marvel of engineering.

But if you were told that this masterpiece of mechanical engineering has had holes in it since 2010, would you believe it? Yes, you read that right. The ISS has holes in it. 7, to be precise. And they have been there since 2010. The questions most likely to arise are how could machinery designed by some of the world's brightest engineers- working in an industry known for its exceptionally slim margin for errors and its intolerance towards anything swaying from precision- have such a fatal flaw creep into their structures. The answer is, it's not a flaw in the first place.

The ISS's Italian-made Cupola observation module features 6 windows on its walls and one at its top, providing the astronauts with an unprecedented 360 degree view out of the space station. These glass windows are, however, vulnerable to impacts from space debris and micrometeorites travelling at several times the speed of sound which could easily shatter the fragile glass windows.

To avoid possibility, aluminum shutters were installed for each of the windows. Now, here comes the interesting part. As electrical components are likely to fail in the harsh radiation filled environment, an entirely mechanical solution is adopted. The shutters are operated by twisting a knob inside the module. This knob's motion is mechanically transferred to the shutter's external mechanism by means of a flexible rod which goes through the module's hull! The only physical barrier separating the spacecraft's inside from space are 6 rubber O-rings installed between the rods and a groove in the hull to maintain a pressure seal. The brilliant mechanism designed by NASA engineer Charie Van Valkenberg consists of rubber O-rings compressed in their groves and are able to twist as the rod moves in and out, and are hence called "dynamic O-rings".

It is simply astonishing that in a structure possessing the most cutting-edge technology, such simple mechanisms prove to be so crucial for its operation at such a fundamental level. In the era of computers, this explains why mechanical engineering is considered by many an "evergreen field" and is evidence for the magical power and importance of mechanical engineering and the eternal need for the genius of brilliant engineers like Charlie van Valkenberg.

Image Sorce: www.space.com

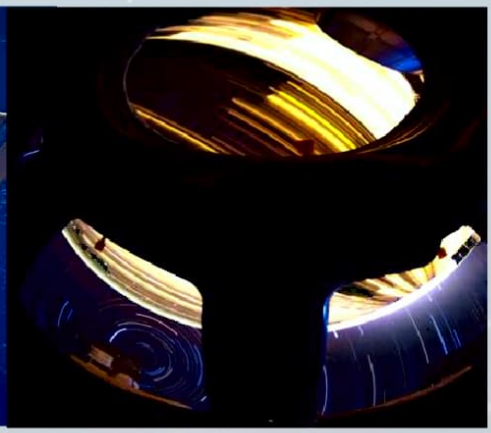


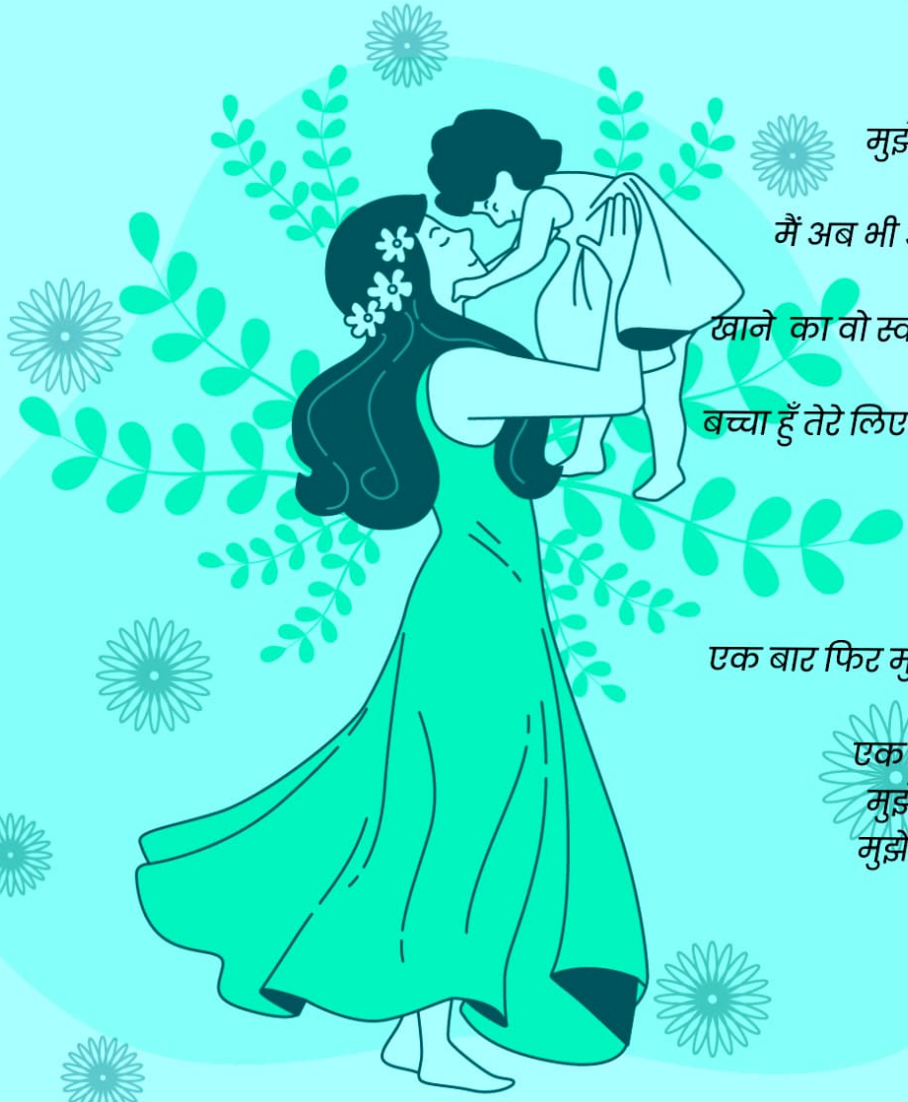
Image Source: www.nasa.gov

Creative corner

By Vishal Kaushik GME-20

माँ का लाडला

पहला कदम मैं माँ का आँचल पाकर के चल दिया,
उस माँ की ख़ुशी के लिए मैं पूरी दुनिया से लड़ लिया,
उसने पौधे को सींच कर एक वृक्ष बना दिया,
मेरी ख़ुशी के लिए उस माँ ने अपना सबकुछ लूटा दिया,
पढ़ा दिया लिखा दिया इस मुकाम तक पंहुचा दिया,
की मैंने हर सम्मान शब्द मैं माँ ही लिख दिया,
और माँ की पसंद जो उसे जीवनसाथी बना लिया,
माँ के हर सपने को मैंने अपना सपना बना दिया,
माँ के आशीर्वाद ने मुझे सबकुछ हासिल करा दिया,
माँ का मैं लाडला मैंने लिख लिख कर सबको बता दिया,



माँ

मुझे एक बार फिर गले से लगा ले न माँ
मेरी सारी गलतियों को भुला दे न माँ
मैं अब भी अंजान हुँ इस दुनिया से मुझे सही राह
दिखा दे ना माँ
खाने का वो स्वाद नहीं रहा अब एक बार फिर अपने
हाथो से खिला दे न माँ
बच्चा हुँ तेरे लिए अब भी तो फिर एक बार बचपन की
तरह मेरे बाल बना दे ना माँ
थक चुका हुँ मैं भागते भागते यहाँ
एक बार फिर मुझे सहला दे न माँ
दुनिया की चकाचौंध मैं खो गया हुँ
एक बार फिर मुझे आवाज़ देके वापिस बुला ले न माँ
सारी बातें भुलाकर आँखें बंद कर लू
एक बार फिर से लोरी गाके सुना दे न माँ
मुझे एक बार फिर गले से लगा ले न माँ
मुझे एक बार फिर गले से लगा ले ना माँ

Faculty Publications:

1. ***Yadav, N., & Kumar, R. (2021)***. Energy harvesting from low-frequency sinusoidal vibrations using diaphragm type piezoelectric element. Indian Journal of Engineering and Materials Sciences (IJEMS), 28(3), 265-270.
2. ***Vashishtha, G., & Kumar, R. (2021***). Pelton Wheel Bucket Fault Diagnosis Using Improved Shannon Entropy and Expectation Maximization Principal Component Analysis. Journal of Vibration Engineering & Technologies, 1-15.
3. ***Vashishtha, G., & Kumar, R. (2021)***. Centrifugal pump impeller defect identification by the improved adaptive variational mode decomposition through vibration signals. Engineering Research Express.
4. ***Vashishtha, G., & Kumar, R. (2021)***. An effective health indicator for the Pelton wheel using a Levy flight mutated genetic algorithm. Measurement Science and Technology, 32(9), 094003.
5. ***Kumar, S., & Kumar, R. (2021)***. Diagnosis of an incipient defect in a worm gearbox using minimum entropy deconvolution and local cepstrum. Measurement Science and Technology, 32(5), 054002.
6. ***Kumar, A., Gandhi, C., Hesheng, T. A. N. G., Vashishtha, G., Kumar, R., Yuqing, Z. H. O. U., & Xiang, J. (2021)***. Adaptive sensitive frequency band selection for VMD to identify defective components of an axial piston pump. Chinese Journal of Aeronautics.
7. ***Vashishtha, G., Chauhan, S., Singh, M., & Kumar, R. (2021)***. Bearing defect identification by swarm decomposition considering permutation entropy measure and opposition-based slime mould algorithm. Measurement, 178, 109389.
8. ***Singla, A. K., Banerjee, M., Sharma, A., Singh, J., Bansal, A., Gupta, M. K., ... & Goyal, D. K. (2021)***. Selective laser melting of Ti6Al4V alloy: Process parameters, defects and post-treatments. Journal of Manufacturing Processes, 64, 161-187.
9. ***Singh, J., & Shahi, A. S. (2021)***. Electrochemical corrosion behavior and microstructural characteristics of electron beam welded UNS S32205 duplex stainless steel. Materials and Corrosion.
10. ***Kumar, S., Shahi, A. S., Sharma, V., & Malhotra, D. (2021)***. Effect of welding heat input and post-weld thermal aging on the sensitization and pitting corrosion behavior of AISI 304L stainless steel butt welds. Journal of Materials Engineering and Performance, 30(3), 1619-1640.
11. ***Singh, M., Shahi, A. S., & Singh, D. (2021)***. Influence of heat input on the pitting corrosion and tensile behavior of GTA welded martensitic stainless steel (AISI410 SS) joints. Materials Today: Proceedings.
12. ***Malhotra, D., Shahi, A. S., & Gupta, K. (2021)***. Effect of GTAW remelting on the corrosion performance of AISI 316L cladding. Materials and Corrosion, 72(1-2), 141-153.
13. ***Jayant, A., Singh, S., & Walke, T. (2021)***. A Robust Hybrid Multi-criteria Decision-Making Approach for Selection of Third-Party Reverse Logistics Service Provider. In Advances in Production and Industrial Engineering (pp. 423-443). Springer, Singapore.
14. ***Bansal, A., Singh, J., Singh, H., & Goyal, D. K. (2021)***. Influence of thickness of hydrophobic polytetrafluoroethylene (PTFE) coatings on cavitation erosion of hydro-machinery steel SS410. Wear, 203886.
15. ***Bansal, A., Singh, J., & Singh, H. (2021)***. Investigating slurry erosion behavior of a hydro-machinery steel under various impingement variables. Materials Today: Proceedings, 41, 795-800.

16. *Gupta, M. K., Song, Q., Liu, Z., Sarikaya, M., Jamil, M., Mia, M., ... & Pimenov, D. Y. (2021).* Environment and economic burden of sustainable cooling/lubrication methods in machining of Inconel-800. Journal of Cleaner Production, 287, 125074.
17. *Pandey, S., Bansal, A., Omer, A., Singla, A. K., Goyal, D. K., Singh, J., & Gupta, M. K. (2021).* Effect of fuel pressure, feed rate, and spray distance on cavitation erosion of Rodojet sprayed Al2O3+ 50% TiO2 coated AISI410 steel. Surface and Coatings Technology, 410, 126961.
18. *Saini, S., & Singh, K. (2021).* Recycling of steel slag as a flux for submerged arc welding and its effects on chemistry and performance of welds. The International Journal of Advanced Manufacturing Technology, 114(3), 1165-1177.
19. *Singh, G., Saxena, R. K., & Pandey, S. (2021).* Investigating the effect of arc offsetting in AISI 304 stainless steel and copper welding using gas tungsten arc welding. Journal of the Brazilian Society of Mechanical Sciences and Engineering, 43(3), 1-22.
20. *Jasra, Y., Singhal, S., & Saxena, R. K. (2021).* Effect of joint design on residual stresses in AISI-304 stainless steel weldment-a numerical study. Journal of Mechanical Science and Technology, 35(5), 2167-2176.
21. *Singh, P. K., & Gulati, V. (2021).* Tolerance analysis and yield estimation using Monte Carlo simulation–case study on linear and nonlinear mechanical systems. Sādhanā, 46(1), 1-20.
22. *Singh, P. K., Modanwal, R. P., & Kumar, D. (2021)*. Fabrication and mechanical characterization of glass fiber/Al 2 O 3 hybrid-epoxy composite. Sādhanā, 46(1), 1-10.
23. *Dang, S. K., & Singh, K. (2021).* Predicting tensile-shear strength of nugget using M5P model tree and random forest: An analysis. Computers in Industry, 124, 103345.
24. *Sumit Kumar and Pardeep Gupta,* "Implementation of Cost Management Initiatives through TQM in an Indian Automotive Industry: A Case Study", International Journal of Disaster Recovery and Business Continuity (IJDRBC), ISSN: 2005-4289(Print); 2207-6425(Online), NADIA, (2021), Vol. 12, No. 1, pp. 25-38.
25. *Kumar, A., Rathi, A., Kundalwal, S.I. and Singh, S., 2021.* Adhesive and Viscoelastic Response of MWCNT/ZrO2 Hybrid Epoxy Nanocomposites, Journal of Mechanics of Materials and Structures, Mathematical Sciences Publishers, 16-3, pp. 281–292.
26. *Singh, M. and Singh, S., 2021.* Multi objective optimization of Electro Discharge Machining of Nimonic 75 using Taguchi Based Grey Relational Analysis. Journal of Advanced Manufacturing Systems ISSN (print): 0219-6867, World Scientific. 20(1), pp. 95-110.
27. *Kumar, A. and Singh, S., 2021.* Parametric optimization of wire electro discharge machining of Inconel 718 using Taguchi's methodology. Materials Today: Proceedings, Elsevier, 43, pp.2025-2031.
28. *Singh, M. and Singh, S., 2021.* Multiple response optimization of ultrasonic assisted electric discharge Machining of Nimonic 75: A Taguchi-Grey relational analysis approach. Materials Today: Proceedings, Elsevier, 45, pp.4731-4736.
29. *Verma, A.S. and Singh, S., 2021.* Parametric optimization of silicon slicing using wire electro discharge machining. Materials Today: Proceedings, Elsevier, Elsevier, 44, pp.4293-4298.
30. Gupta Pardeep and Mittal Ankesh, 2021. Exploring the Business Challenges and Techniques used for Improving Customer Satisfaction through TQM: An Empirical study, Journal of Advanced Manufacturing Systems, pp 1-19.
31. Gupta Pardeep and Mittal Ankesh, 2021. An Empirical Study on Enhancing Product Quality and Customer Satisfaction Using Quality Assurance Approach in an Indian Manufacturing Industry, International Journal of Mathematical, Engineering and Manage-

Alumni Corner

Word from Alumni's

Life at SLIET is vibrant, energetic and thrilling all in one. Peaceful environment enriches the stay. This is definitely, one of the reasons why students desire to pursue their studies here. There are ample number of co-curricular activities whether technical, cultural, social or sports events, to keep the students occupied. Infact, study at SLIET was the turning point which changed my entire life.

Hemraj Gambhir
GME-2003 batch
Senior Manager
HAL Kanpur

The opportunities and experiences I have got at SLIET is unparalleled. At every step I was fortunate to meet some very different and motivated set of minds be it my own batchmates, faculty or seniors. Together with good education at SLIET I was able to stretch my boundaries participating in various extra-curricular activities which helped me for the wholesome development to face challenges outside.
"Learned, unlearned relearned and in the process made memories for the lifetime"
Suggestions-A more interactive approach in curriculum towards the real time challenges connect with the present industry demand would be better.

Vishal Singh
GME2k18 passout
(Mechanical Engineer at Sidel)

SLIET was more than a college to me. It's a privilege to be connected to this institution. A place where I gained research related knowledge, best needed for the survival in outer world and confidence. Right from day first energy and enthusiasm is what I experienced be it faculty or students. I am what I am this day because of the curriculum, the teaching methodology adopted by the professors. The computer Lab was our innovation center/lab and the problems solved there were the most complicated problems solved till date. An Amazing institution which teaches you selfdiscipline, confidence and problem solving an essential trait to start your journey. Finally, I thank the institute and the faculty for all the efforts put in by them, along with the perseverance and right moves have paid off finally. All my batch mates are doing well in their respective jobs which reflect the quality of the students the institute has produced.

Dr. Tameshwer Nath
Assistant Professor,
Mechatronics Engineering,
IIIT, Bhagalpur

SLIET is place where Dreams come true. It is a place of tremendous resources which assists students to achieve unimaginable heights. There is a perfect blend of Education, Learning and Skill building at SLIET which stretches amazing ambience for growth and development. SLIET has every basic facility that a Young Indian would need, it is them who have to make best use and contribute in Nation Building.

Kumar Pranshu
GME 2020 pass out
GOODREJ

Before coming to SLIET, I used to be an introvert who did only played cricket other than Studies. Once I joined SLIET, it was totally a different world for me and remained as one for next 4 yr. I experienced a lot of changes in my Attitude, Personality through my journey. I met a people with different mindsets, I made so many friends and beautiful memories with them. And I had never imagined that I would pave my way with programming, since I did not even know how to actually start a pc, but eventually in first year of my college I joined Endeavour and got so much assistance from my seniors and batchmates, they were there for every bit of help let it be borrowing laptop from the or asking their advices. So nostalgic I feel remembering those days. I did not expect or thought my designation would be turned upside-down from a Mechanical Engineer to Software Developer. Thank You so much SLIET for giving me my life's best experience.

Vishal Kumar
GME-2020 pass out
Software Developer at TCS

Alumni Achievements

1. It is a matter of pleasure and pride to share that SLIET alumnus ***Er. Vikash Chandra***, a student of the GME-2k9 batch secured all India rank 24 in Union Public Service Commission. The department congratulates him for his success and wishes him all the best for his future endeavours

2. It gives us immense pleasure to share that ***Er. Rahul Solanki***, a M. Tech student of 2018 batch selected as Assistant engineering in Public Works Department, Uttar Pradesh.

Department of Mechanical Engineering

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