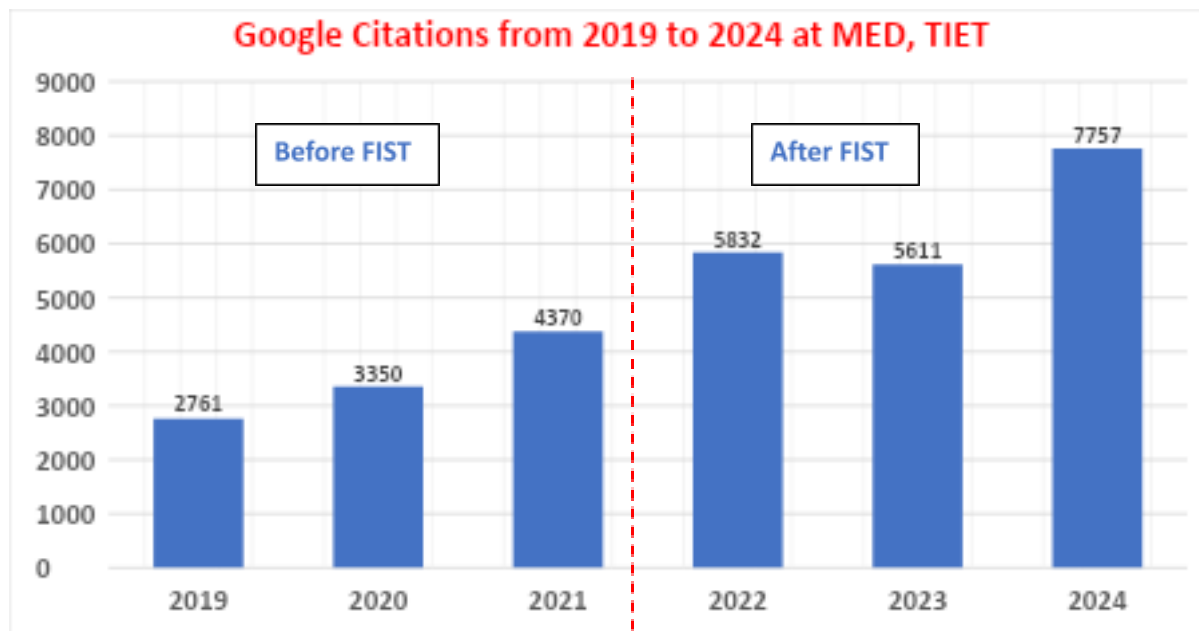


**1. Any trend in improvement of the Impact Factor/ Citations of the publications.**

|           |      |      |      |      |      |      |
|-----------|------|------|------|------|------|------|
| Year      | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
| Citations | 2761 | 3350 | 4370 | 5832 | 5611 | 7757 |



**2. Any new extramural research grants obtained following FIST support:**

| Sr. No. | Name of Project                                                                                           | Funding Agency                            | PI/Co-PI details                                           | Amount (Lakhs) | Year    |
|---------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------|----------------|---------|
| 1.      | Design and Development of 3D Printed Bio-metamaterial for Bone Implants                                   | Dassault Systemes Foundation, Pune, India | Dr. Sachin Singh (PI)<br>Dr. Jaswinder Singh Saini (Co-PI) | 10.55          | 2023-25 |
| 2.      | Development of Unilateral Lower-Limb Exoskeleton for Synchronous Walking Assistance during Rehabilitation | DST-CRG                                   | Dr. Ashish Singla                                          | 44.29          | 2023-26 |
| 3.      | Study of materials, technologies and equipment for 3D printing of polymeric medical devices (on           | DST International Joint proposal          | Dr. Vishal Gupta, and Dr. Deepa Mudgal                     | 15.1           | 2023-25 |

|    |                                                                                                                                 |                                           |                                                                                   |       |         |
|----|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------|-------|---------|
|    | the example of a bone plate) with improved mechanical and biological properties                                                 | INDIA-BEL ARUS                            |                                                                                   |       |         |
| 4. | Development of smart implants for monitoring of bone fracture healing                                                           | SERB SURE                                 | Dr. Vishal Gupta, Dr. Jaskaran Singh, and Dr. Gyanendra Singh                     | 25.7  | 2023-26 |
| 5. | Development of Cross-contamination-free portable suction assembly for airways clearance in mechanically ventilated patients.    | Indian Council of Medical Research (ICMR) | Dr. D. Choudhury, Dr. Ravinder Kumar Duvedi, Dr. Vineet Srivastava, Prof. B. Ghai | 23.23 | 2022-25 |
| 6. | Parametric Design of 3D Insole considering Orthopaedic Deformities based on Plantar Pressure and 3D Geometry of the Human Feet. | Dassault Systemes Foundation              | Dr. Vineet Srivastava and Dr. Ravinder Kumar Duvedi                               | 22.15 | 2022-23 |

### 3. Student performance in National Level Exams like NET, GATE, SLET etc

| Sl. No. | Student Name     | Roll No.  | UG/PG | Branch | Exam Cleared           | Roll no. of the exam cleared |
|---------|------------------|-----------|-------|--------|------------------------|------------------------------|
| 1       | Angad Deep Singh | 101808167 | UG    | MEE    | GATE                   | ME22S78027129                |
| 2       | Siddharth Garg   | 101808186 | UG    | MEE    | GATE ME 2022 (AIR 197) | ME22S88036160                |
| 3       | Semanpreet Singh | 102008065 | UG    | MEE    | GATE EXAM CLEARED      | T493V83                      |
| 4       | Piyush Zaware    | 102008098 | UG    | MEE    | GRE                    |                              |
| 5       | Chaitenye Vaid   | 102008109 | UG    | MEE    | CAT                    | 23325593                     |
| 6       | Yash Chamoli     | 102008161 | UG    | MEE    | CDS/AFCAT              | 1403578/2024001120116        |
| 7       | Abhinav Garg     | 102008006 | UG    | MEE    | NMAT                   | NA                           |

|    |                |           |    |     |      |               |
|----|----------------|-----------|----|-----|------|---------------|
| 8  | Yudhish Koul   | 102009001 | UG | MTX | CDS  | 3500421       |
| 9  | Arsh Kesarwani | 102009027 | UG | MTX | CAT  | 23002684      |
| 10 | Apoorv Saxena  | 102009038 | UG | MTX | GATE | EC24S78307028 |

#### 4. Student output in terms of No. of PhDs awarded following FIST support

| Student name    | Title                                                                                     | Guide name S                                  | Submission year           |
|-----------------|-------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------|
| Prakhar Jain    | Design and Control of a Knee Exoskeleton with Multiple Actuators                          | Dr. Tarun Kumar Bera<br>Dr. Ashish Singla     | 2024<br>(Defence pending) |
| Manveer Rana    | Design and Development of 3D Printed Bio-metamaterial for Bone Implants                   | Dr. Sachin Singh<br>Dr. Jaswinder Singh Saini | On-going                  |
| S. Anup Chander | Modeling, analysis and robust control of lower-limb exoskeleton for strength augmentation | Dr. Ashish Singla                             | On-going                  |

#### 5. Fellowship, awards, recognition for the faculty following FIST support

- Dr. Vishal Gupta Assistant Professor, and Dr. Deepa Mudgal Assistant Professor, visited (21-28 September 2024) the National Academy of Science in Belarus related to the ongoing project funded by the DST under the international joint project Scheme.
- Dr. R.K. Duvedi has delivered invited talk at the Centre for Innovation and BioDesign (CIBioD), PGIMER, Chandigarh, August 2022.
- Dr. Ashish Singla and Dr. R K Duvedi visited University of Queensland and University of Wollongong and UNSW Sydney.
- Dr. Vineet Srivastava visited Tel Aviv University, Israel
- In December 2024, Dr. Ashish Singla delivered multiple talks in the area of lower limb exoskeletons at IIT Gandhinagar, Tezpur University Assam, IIT Guwahati, Nirma University Ahmedabad and IIT Ropar.

#### 6. Different ongoing programs for skill development and capacity building including involvement of research scholar, post-doctoral fellows, scientist.

- Dr. Satish Kumar Sharma, Assistant Professor, and Dr. Vishal Gupta, Assistant Professor, successfully conducted Five-days Faculty Development Program on Additive Manufacturing: from Principles to Practice (12-16 February 2024).

- Dr. Daljeet Singh, Associate Professor, and Dr. Vishal Gupta, Assistant Professor, successfully conducted Five-days Faculty Development Program on Latest Trends in Additive Manufacturing (17-21 February 2025).
- Dr. R.K. Duvedi and Dr. Bikramjit Sharma organized six weeks summer internship program for UG students (21-22, 22-23, 23-24).

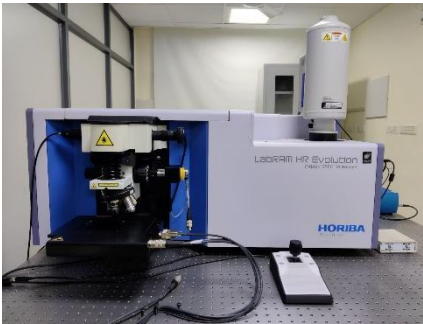
**7. Different ongoing programs for skill development and capacity building including involvement of incubators, start-ups, MSMEs.**

- Startup named “*Briizy*” initiated by Aditya Prakash in 2023 (3rd year CSE).
- Innovation: A desktop air purifier that uses natural materials like charcoal and mosses along with HEPA filters to purify office rooms. Please see the poster attached.
- Biogas slurry separator by Harperteek Singh (1st year electrical engg)
- Innovation: While industrial scale slurry separators are available, there is none existing for households. Also the farmers are unable to make the best use of the slurry. Please see the pitch deck attached (SIFT INNOVATES)
- Venture Lab Program (Ignite-Launch-Accelerate). 3 stage program spanning 10 weeks in every stage. 20-25 participants per cohort(group). Intake: 2-3 times per year
- <https://venturelab.org.in/ignite-launch-accelerate>  
Venture Lab Weekend (52-hour business modeling hackathon)  
-<https://venturelab.org.in/event/venture-lab-weekend>
- Knowledge sessions in association with Startup Punjab  
<https://venturelab.org.in/event/angel-investing-in-startups>
- Supporting startup related programs as part of society events in Thapar Institute (MarkFIn society, Saturnalia, Thapar Venture Club etc)

**8. Prior experience of NABL accredited / certified central facilities / laboratories of Department / institute/ organization, if any**

List of Equipment under Material Characterization Facilities (MCF), Thapar Institute of Engineering & Technology Patiala.

| Sl. No. | Name of Instrument with Model number                                                              | Image of the Instrument                                                              |
|---------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| 1       | Scanning Electron Microscope (SEM)<br><b>Make:</b> Carl Zeiss, Germany<br><b>Model:</b> Sigma 500 |  |

|   |                                                                                                                                       |                                                                                                                                                                                                                                                                                                                         |
|---|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | <p>X-Ray Diffractometer (XRD)</p> <p>Make: Rigaku, Japan</p> <p>Model: SmartLab SE</p>                                                |  <p>A tall, blue and white X-ray diffractometer with two vertical goniometers and a central control panel. The Rigaku logo is visible at the top, and 'SmartLab' is printed on the front panel.</p>                                   |
| 3 | <p>Raman and PL Spectrometer (RAMAN)</p> <p>Make: Horiba, France</p> <p>Model: Labram</p> <p>HR Confocal Micro-Raman Spectrometer</p> |  <p>A blue and white Raman spectrometer with a confocal microscope attachment. The Horiba logo is visible on the front. It is set up on a laboratory bench with various cables and a control unit.</p>                               |
| 4 | <p>Multiferroic Test System</p> <p>Make: Radiant Technologies Inc.</p> <p><b>Model:</b> Multiferroic II Ferroelectric Tester</p>      |  <p>A laboratory setup for testing multiferroic materials. It includes a computer workstation with a monitor, keyboard, and mouse, connected to various electronic test equipment and a large blue power supply unit on a desk.</p> |
| 5 | <p>Vibrating Sample Magnetometer (VSM)</p> <p>Make: Lake Shore, USA</p> <p>Model: 7404</p>                                            |  <p>A VSM system consisting of a sample stage with a blue coil, connected to a computer workstation. The system is housed in a black metal frame, and the Lake Shore logo is visible on the side of the main unit.</p>              |

|   |                                                                                      |                                                                                     |
|---|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 6 | ICP-OES Analysis<br>Make: Teledyne Leeman Labs, USA<br><b>Model:</b> Prodigy         |   |
| 7 | Scanning Probe Microscope (SPM)<br>Make: NT-MDT, Russia<br><b>Model:</b> Solver NEXT |  |

| Sl. No. | Name of equipment (Folder. No.) | Identification No. | Present Location                        | Last calibration Done | Due date of calibration | Calibration Agency                |
|---------|---------------------------------|--------------------|-----------------------------------------|-----------------------|-------------------------|-----------------------------------|
| 1       | Flue Gas Analyzer (25)          | SAI/FGA/104        | Field Monitoring Equipment Room No. 109 | 31-07-2024            | 31-07-2025              | Nevco engineers                   |
| 2       | Standard Weight Box (22)        | SAI/SWB/100        | Lab Incharge Room No. 105               | 13-09-2024            | 12-09-2025              | Indiana                           |
| 3       | Stack Monitoring Kit (34)       | SAI/SMK/091        | Field Monitoring Equipment Room No. 109 | 18-10-2024            | 18-10-2025              | Envirotech Calibration Laboratory |
| 4       | Hot air oven (01)               | SAI/OVN/007        | Analytical Lab-I Room No. 104           | 16-10-2024            | 15-10-2025              | Trucal Metrological Services      |
| 5       | Hot air oven (02)               | SAI/OVN/019        | Analytical Lab-II Room No. 106          | 16-10-2024            | 15-10-2025              | Trucal Metrological Services      |

|    |                                 |               |                               |            |            |                                  |
|----|---------------------------------|---------------|-------------------------------|------------|------------|----------------------------------|
| 6  | Incubator (04)                  | SAI/INCUB/057 | Microbiology Lab room No. 202 | 16-10-2024 | 15-10-2025 | Trucal Metrological Services     |
| 7  | BOD Incubator (05)              | SAI/INCUB/085 | Ground Floor Lab Corridor     | 16-10-2024 | 15-10-2025 | Trucal Metrological Services     |
| 8  | Incubator (06)                  | SAI/INCUB/096 | First floor corridor          | 16-10-2024 | 15-10-2025 | Trucal Metrological Services     |
| 9  | Muffle furnace (08)             | SAI/MF/067    | Analytical Lab-I Room No. 104 | 16-10-2024 | 15-10-2025 | Trucal Metrological Services     |
| 10 | Weather Monitoring Station (39) | SAI/WMS/101   | Room No. 102                  | 18-11-2024 | 17-11-2025 | Envirotech Instruments Pvt. Ltd. |

**9. In & around MSME survey reports / tie-up reports about existing facility / running shared equipment central facilities of your department / institute.**

Details of Industries and Academia associated with Material Characterization Facility (MCF), Thapar Institute of Engineering and Technology Patiala, Punjab.

| Sl. No. | Name of Users                                         | Facility use | Year                    |
|---------|-------------------------------------------------------|--------------|-------------------------|
| 1       | Krishna Metallurgical Laboratory, Delhi               | SEM Analysis | December 2022           |
|         |                                                       | SEM Analysis | January 2023            |
|         |                                                       | SEM Analysis | August-December 2023    |
|         |                                                       | SEM Analysis | January-August 2024     |
|         |                                                       | SEM Analysis | December 2024           |
|         |                                                       | SEM Analysis | January 2025            |
| 2       | Lonestar Technical and Industrial Services, Abu Dhabi | SEM Analysis | January 2022            |
|         |                                                       | SEM Analysis | November, December 2022 |
|         |                                                       | SEM Analysis | February 2023           |
|         |                                                       | SEM Analysis | April & June 2023       |
|         |                                                       | SEM Analysis | September 2023          |
|         |                                                       | SEM Analysis | April 2024              |
|         |                                                       | SEM Analysis | August & September 2024 |
| 3       | Abryl Laboratories, Mohali                            | SEM analysis | April 2024              |
|         |                                                       | SEM Analysis | September 2024          |
| 4       | Vardhman Steels, Ludhiana                             | SEM Analysis | June 2022               |

|    |                                            |              |                        |
|----|--------------------------------------------|--------------|------------------------|
| 5  | Arjas Steels,<br>Fatehgarh Sahib           | SEM Analysis | April 2024             |
|    |                                            | SEM Analysis | July 2024              |
|    |                                            | SEM Analysis | January 2025           |
| 6  | National Institute of<br>Technology, Patna | SEM Analysis | January 2023           |
| 7  | Indian Institute of<br>Technology Jodhpur  | SEM Analysis | February 2023          |
| 8  | Sri Mata Vaishnava<br>University, Jammu    | SEM Analysis | April, May 2022        |
|    |                                            |              | June, July 2023        |
| 9  | GNGC                                       | SEM Analysis | March 2023             |
| 10 | DTU, Delhi                                 | SEM Analysis | May 2023               |
|    |                                            |              | December 2023          |
| 11 | ISRO, Kerala                               | SEM Analysis | April 2022             |
|    |                                            |              | August, September 2022 |
| 12 | CDVLU, Haryana                             | SEM Analysis | October 2022           |
|    |                                            |              | March, April 2023      |
|    |                                            |              | October 2024           |
| 13 | Punjab Agriculture<br>University, Punjab   | SEM Analysis | August 2024            |
|    |                                            |              | January 2025           |
| 14 | MULLANA<br>University, Ambala              | SEM Analysis | August 2024            |
| 15 | CSIU Chandigarh                            | SEM Analysis | July 2023              |

**10. Any attempt / provision to access and sharing of scientific equipment and research infrastructure (RI) OR through I-STEM portal uploading etc.**

**Uploaded and it is under Review by I-STEM authority.**