

DR. AMBEDKAR INSTITUTE OF TECHNOLOGY

(An Autonomous institute affiliated to Visvesvaraya Technology University, Belagavi,
Accredited by NAAC, UGC with 'A' Grade) Near Jnana Bharathi Campus, Bengaluru – 560056



DEPARTMENT OF MECHANICAL ENGINEERING

(Accredited by NBA)

A REPORT

ON

INDUSTRIAL VISIT

TO

**LASER WORLD OF PHOTONICS INDIA 2026
BANGALORE INTERNATIONAL EXHIBITION
CENTRE (BIEC), BENGALURU**

SUBMITTED BY: -

7th Semester Mechanical Engineering Students

Date of Visit: 16 September 2026

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ACKNOWLEDGEMENT

We express our sincere gratitude to the organizers and participating exhibitors of **LASER World of PHOTONICS INDIA 2026** for providing us with the opportunity to visit the exhibition held at **Bangalore International Exhibition Centre (BIEC), Bengaluru**. The exhibition provided us with valuable exposure to recent developments in laser technology, photonics, optics, industrial automation, measurement systems and advanced manufacturing technologies.

We would like to express our heartfelt thanks to the **Principal, Dr. Mahalinga V. Mandi, Head of the Department of Mechanical Engineering, Dr. Sathish S**, and our faculty coordinators **Dr. Shivappa H. A** and **Dr. Preethi K**, **Dr Ambedkar Institute of Technology**, Bengaluru, for their constant support, encouragement, and guidance in organizing this industrial visit.

We also extend our sincere thanks to all the teaching and non-teaching staff of the Mechanical Engineering Department for their cooperation. Finally, we thank our classmates for their support and teamwork, which made this industrial visit a successful and memorable learning experience.

7th Semester Mechanical Engineering Students
Dr Ambedkar Institute of Technology
Bengaluru

DETAILS OF VISIT

An industrial visit was organized for the students of the **7th Semester Mechanical Engineering**, Dr. Ambedkar Institute of Technology, Bengaluru, to **LASER World of PHOTONICS INDIA 2026** at the Bangalore International Exhibition Centre (BIEC), Bengaluru.

The visit provided students with an opportunity to explore advanced technologies associated with lasers, photonics, optical systems, laser-based manufacturing and industrial automation.

Upon arrival at the exhibition venue, the students completed the registration process and entered the exhibition halls. The students visited various stalls and interacted with representatives from different companies to understand the working principles and industrial applications of the technologies displayed.

The visit provided practical exposure to technologies that complement concepts studied in mechanical engineering, including manufacturing processes, automation, robotics, precision engineering, material processing and quality inspection.



Fig. 1: Students arriving at the registration area of LASER World of PHOTONICS INDIA 2026 at BIEC, Bengaluru.

ABOUT LASER WORLD OF PHOTONICS INDIA 2026



Fig. 2: Entrance to Hall 1 of LASER World of PHOTONICS INDIA 2026 at BIEC, Bengaluru.

LASER World of PHOTONICS INDIA is an exhibition focused on laser technology, photonics, optical components, systems and their industrial applications. The exhibition brings together technology developers, manufacturers, industry professionals, researchers and users of laser and photonic technologies.

The exhibition provided an opportunity for students to observe a wide range of technologies including industrial laser systems, fibre lasers, laser cutting and welding systems, robotic laser processing, optical components, beam-shaping technologies, sensors and other photonics-related solutions.

From a mechanical engineering perspective, the exhibition was particularly relevant because laser technology is increasingly used in precision manufacturing, material processing, joining, cutting, marking, automation and robotic manufacturing systems.

INDUSTRIAL VISIT & PLANT OBSERVATION

LASER-BASED MANUFACTURING TECHNOLOGIES

Laser technology has become an important tool in modern manufacturing because of its ability to deliver concentrated energy to a precisely controlled location. This enables high-precision material processing with reduced physical contact between the tool and workpiece.

During the exhibition, various laser-based manufacturing systems were observed, including **fibre laser cutting machines, fibre laser welding systems, spot laser welding machines and robotic fibre laser welding systems.**

These systems demonstrate the integration of laser sources with mechanical motion systems, control systems and automation to achieve accurate and repeatable manufacturing operations.



Fig. 3: Laser-based manufacturing systems displayed by IFT Lasers, including fibre laser cutting and welding technologies.

ROBOTIC FIBER LASER WELDING

Robotic laser welding combines the precision of laser welding with the flexibility and repeatability of industrial robotic systems. The robotic arm provides controlled movement of the laser welding head along the required path.

The system observed at the exhibition consisted of a robotic manipulator integrated with a laser processing head and associated control and power equipment. Such systems can be used for automated joining operations where accurate positioning, repeatability and controlled heat input are important.

The use of robotics also allows complex welding paths to be programmed and repeated consistently, making the technology suitable for automated manufacturing environments.

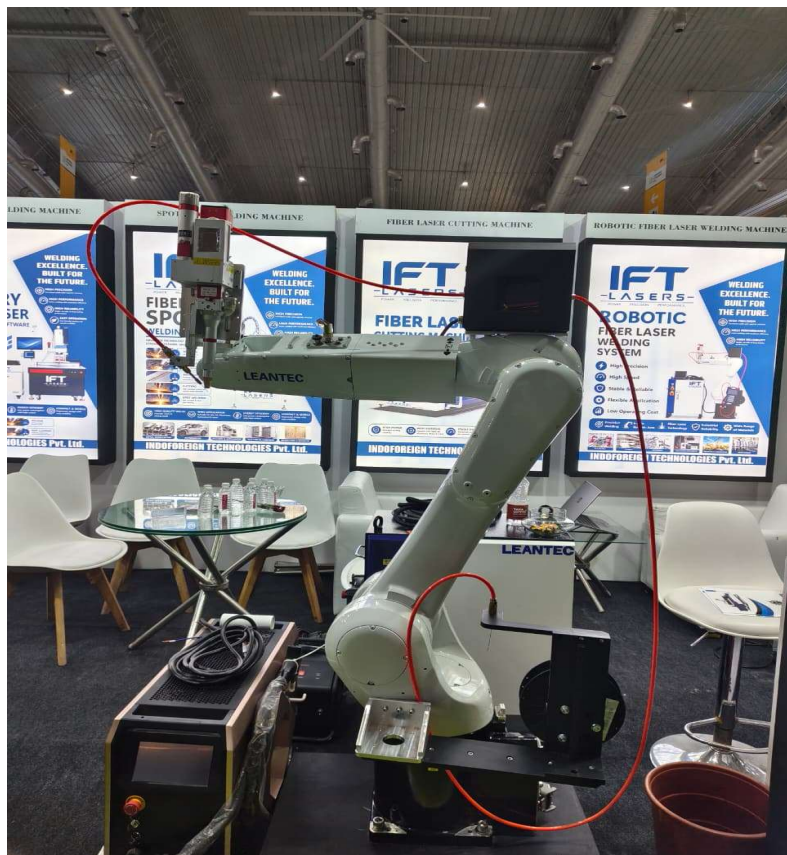


Fig. 4: Robotic fibre laser welding system displayed at the exhibition.

FIBRE LASER CUTTING TECHNOLOGY

Fibre laser cutting is a non-contact manufacturing process in which a focused laser beam is used to melt or vaporize material along a programmed path. The process is suitable for producing accurate profiles and intricate geometries.

The exhibition displayed fibre laser cutting systems designed for precision material processing. The displayed samples included different shapes and intricate profiles, demonstrating the ability of laser cutting systems to produce components with detailed geometries.

Compared with conventional cutting processes, laser cutting can provide high dimensional accuracy, narrow kerf width and the ability to produce complex profiles with computer-controlled motion.



Fig 5: Students interacting with the exhibitor and observing laser-processed components.

OPTICAL COMPONENTS AND BEAM SHAPING

Optical components play an important role in controlling, directing and shaping laser beams. During the visit, students interacted with representatives at an **Asphericon** display and learned about optical solutions associated with beam shaping and laser applications.

The displayed information highlighted applications involving uniform illumination, homogeneous profiles, controlled light and beam shaping. Such optical systems are important for controlling the distribution and characteristics of laser light according to the requirements of different applications.

The interaction helped students understand that laser systems are not limited to the laser source itself, but also require carefully designed optical components for effective beam delivery and processing

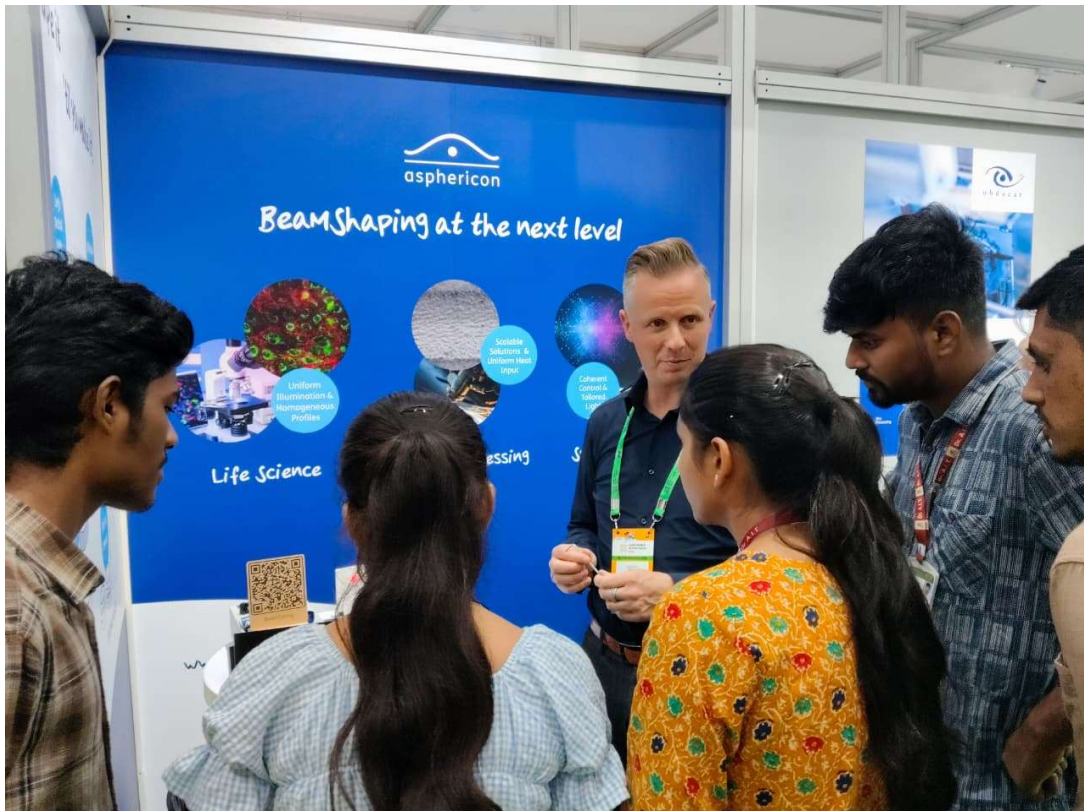


Fig 6: Students interacting with an exhibitor regarding optical and beam-shaping technologies.

LASER OPTICS AND OPTICAL FILTERS

Various optical components used in laser and photonic systems were observed during the exhibition. The displayed components included **laser optics, wide-angle filters, laser ring filters, laser system filters, Raman filters and metallized windows.**

Optical filters are used to selectively transmit or block specific ranges of wavelengths, while optical elements help control the propagation and characteristics of light.

These components are important in applications involving laser systems, imaging, spectroscopy, sensing and optical measurement. The display helped students understand the importance of precision optical components in controlling and manipulating light.



Fig. 7: Optical components and filters displayed during the exhibition.

PHOTONICS, FIBRE OPTICS AND INDUSTRIAL APPLICATIONS

The exhibition also showcased a wide range of photonics and optical technologies. Displays included optical and fibre-related equipment, components and systems intended for industrial and electronic applications.

Fibre-optic technologies are widely used for transmitting optical signals over long distances and are important in communication, sensing and high-speed data systems.

The exhibition demonstrated how photonics extends beyond laser manufacturing and contributes to areas such as optical communication, sensing, imaging, electronics and industrial systems.



Fig. 8: Photonics and optical technology displays at the exhibition.

PHOTONICS AND ELECTRONICS IN AUTOMOTIVE APPLICATIONS

The exhibition also provided exposure to electronic technologies used in automotive applications. The **Taiyo Yuden** display presented electronic components and solutions intended for automotive systems.

The displayed information highlighted applications associated with vehicle systems and automotive electronics. This demonstrated the increasing integration of electronic, sensing and communication technologies in modern vehicles.

For mechanical engineering students, such displays provided an understanding of the interdisciplinary nature of modern automotive engineering, where mechanical systems are increasingly integrated with electronic and sensing technologies.



Fig. 9: Automotive electronic solutions displayed by Taiyo Yuden.

INTERACTION WITH INDUSTRY PROFESSIONALS AND LEARNING OUTCOMES

One of the important aspects of the visit was the opportunity to interact directly with industry professionals. Students discussed the working principles, applications and practical challenges associated with laser and optical technologies.

These interactions helped students connect theoretical concepts with industrial applications. The visit also provided an understanding of how mechanical engineering, electronics, optics, automation and robotics are integrated in modern manufacturing systems.

The exhibition enhanced our awareness of emerging technologies and demonstrated the importance of interdisciplinary knowledge in advanced engineering industries.



Fig.10: Students of 7th Semester Mechanical Engineering during the industrial visit at BIEC.

CONCLUSION

The industrial visit to **LASER World of PHOTONICS INDIA 2026** at the Bangalore International Exhibition Centre provided valuable exposure to modern laser, photonics and optical technologies.

During the visit, students observed technologies including **fibre laser cutting, fibre laser welding, robotic laser welding, optical components, beam-shaping systems, optical filters and photonics-based industrial solutions**. The demonstrations and interactions with industry professionals helped us understand the practical applications of these technologies.

The visit also highlighted the integration of mechanical engineering with robotics, automation, optics, electronics and advanced manufacturing. It helped bridge the gap between theoretical knowledge acquired in the classroom and its practical implementation in modern industries.

Overall, the visit was an informative learning experience that enhanced our understanding of emerging manufacturing and photonics technologies and their role in the future of engineering.