Details of Workshops & Seminars

S. No.	Faculty Lead	Workshop/Seminar	Title	Date
1.	Engr. Sarfaraz Khan Turk	**Seminar**	**Application of piezoelectric Quartz crystal oscillation for diagnosis and treatment purposes.** (Electrical & Electronics Lab IBET, LUMH)	30-04-2026
2.	Engr. Zohaib	**Seminar**	**"Basic health and safety rules"** (Electrical/Electronic Lab, IBET LUMH)	28-04-2026
3.	Engr. Zohaib	**Seminar**	**"Single line diagram of power system"** (Electrical/Electronics Lab, IBET LUMH)	27-04-2026
4.	Engr. Saleha Memon	**Seminar**	**Robotic Sensing: From Basic to Advanced Sensors** (IBET, LUMHS)	20-04-2026
5.	Engr. Murk Saleem	**Seminar**	**"Biomaterials in Modern Medicine: From Implants to Tissue Regeneration"** (Computer & Telemedicine Lab IBET, LUMHS)	08-04-2026
6.	Engr. Asad Ali Rajpar	**Workshop**	**"Introduction to LabVIEW and learn to design and develop applications of different software-based virtual Biomedical Instruments"** (Computer & Telemedicine Lab IBET, LUMHS)	07-04-2026
7.	Engr. Saeed Ahmed	**Seminar**	**IDENTIFYING &EVALUATING BUSINESS OPPORTUNITIES.** **(**IBET, LUMHS)	6-04-2026
8.	Engr. Natasha	**Seminar**	**Analog Circuit Design for ECG Signal Filtering and Noise Minimization** (Biomedical Instrumentation Lab, LUMHS)	26-03-2026
9.	Engr. Saeed Ahmed	Seminar	**SEMINAR ON MANAGERS AND COMMUNICATION** **(**IBET, LUMHS)	25-03-2026
10.	Engr. Muhammad Furqan	Seminar	**"Bridging Clinical Needs and Technology: A Biomedical Engineer's Approach to Healthcare Management Systems"**	18-02-2026

Details of Workshops & Seminars

			(Computer & Telemedicine Lab IBET, LUMH)	
11.	Engr. Laraib Kehar	Seminar	**Applications of Meta Quest 3 with Meta AI in Biomechanics: A Seminar on Immersive Analysis and Smart Rehabilitation** (FAB Lab IBET, LUMHS)	17-02-2026
12.	Engr. Sasuee Khatoon	**Workshop**	**From Flow to Force: Biofluid Mechanics, Biomechanics, and Applied Physics in Practice** (Bio-fluid Mechanics Lab, LUMH)	16-02-2026
13.	Dr. Sehreen Moorat and Bushra Nadeem	**Workshop**	**Workshop on Arduino (**IBET, LUMHS)	06-02-2026
14.	Engr. Murk Rehman	**Seminar**	**Physics in Everyday Life: The Science Behind the Ordinary** (Lecture Hall-3, IBET, LUMHS)	03-02-2026
15.	Engr. Murk Rehman	**Workshop**	**Hands-on Physics: Exploring Fundamental Experiments and Measurements** (Bio-fluid Mechanics Lab, IBET, LUMHS)	04-03-2026
16.	Dr. Sehreen Moorat and Natasha Mukhtiar	**Seminar**	**Unlock Your Research Super Power From Idea To Publication** (Indus Hotel Hyderabad)	06-12-2025
17.	Engr. Saleha Memon	**Workshop**	**Hands-on Workshop in 3D Printing using Creality Systems** (DSP & Microprocessor Lab, IBET, LUMHS)	28-11-2025
18.	Engr. Murk Saleem	**Workshop**	**“ Hands-on with TDS and Multicolor 3D Printing using Any cubic”** (Digital Signal Processing Lab, LUMHS)	12-11-2025
19.	Engr. Asad Ali Rajpar	**Workshop**	**“Introduction to MATLAB® for Biomedical Control System”** (Computer & Telemedicine Lab IBET, LUMHS)	10-11-2025
20.	Engr. Laraib Kehar	**Workshop**	**Biomechanical Modeling of Human Organ Using SolidWorks and 3D Printing**	04-11-2025

Details of Workshops & Seminars

			(FAB Lab IBET, LUMH)	
21.	Engr. Sasuee Khatoon	**Seminar**	**Fundamentals of Machine Learning in Computer-Aided Diagnostics** (Computer & Telemedicine Lab IBET, LUMH)	03-11-2025
22.	Engr. Sarfaraz Khan Turk	**Seminar**	**Fundamentals of Robotic Actions used in Modern surgeries** (Electrical & Electronics Lab IBET, LUMH)	10-09-2025

Application of piezoelectric Quartz crystal oscillation for diagnosis and treatment purposes.

The seminar on **"Application of Piezoelectric Quartz Crystal Oscillation for Diagnosis and Treatment Purpose"** provides an in-depth understanding of how the piezoelectric properties of quartz crystals are effectively utilized in modern medical technologies. The session begins with a fundamental explanation of piezoelectricity, where quartz crystals produce electrical signals under mechanical stress and exhibit precise oscillations when an electrical voltage is applied. This stable and reliable oscillatory behavior makes quartz crystals highly suitable for frequency control and sensing applications. The seminar then explores their role in diagnostic equipment such as ultrasound imaging systems Treatment applications, including ultrasonic therapy, where controlled vibrations of quartz crystal oscillators are used to achieve therapeutic outcomes. Overall, the seminar equips participants with a clear understanding of how piezoelectric quartz crystal oscillation used in biomedical engineering, for diagnosis and therapy (treatment) purposes

Figure.1. Seminar on Application of piezoelectric Quartz crystal oscillation for

Details of Workshops & Seminars

Basic Health and Safety Rules

This seminar is being conducted to highlight the fundamental health and safety rules essential for preventing accidents and ensuring a safe working environment, particularly in laboratories and engineering settings, by promoting awareness, precautionary measures, and responsible behavior.

Figure.2. Seminar on basic health and safety rules.

Single Line Diagram of a Power System

This seminar is being conducted to provide a clear and concise understanding of the single line diagram of a power system, highlighting its components, structure, and significance in the analysis, design, and operation of modern electrical power systems.

Figure. 3. El/ES Lab for seminar for single line diagram of power system.

Details of Workshops & Seminars

Robotic Sensing: From Basic to Advanced Sensors

This seminar was conducted for seventh semester students (Batch 2023) at IBET LUMHS Jamshoro. The session provided a comprehensive overview of sensors used in robotics, covering both fundamental and advanced sensing technologies. Participants were introduced to various sensors including LVDT, tactile sensors, sniff sensors, and advanced sensors such as piezoelectric sensors. The seminar emphasized the working principles, characteristics, and real-world applications of these sensors in modern robotics. Through interactive discussion and conceptual explanation, participants gained insight into how sensors enable robots to perceive, measure, and respond to their environment, making them essential components in automation and intelligent systems.

Figure.4. Conceptual discussion on the working principles and applications of robotic

Biomaterials in Modern Medicine: From Implants to Tissue Regeneration

The Seminar was conducted at **Computer & telemedicine Lab, IBET LUMHS Jamshoro**. This seminar on "Biomaterials in Modern Medicine: From Implants to Tissue Regeneration," introduced the fundamental role of engineered materials in healthcare applications. It covered key types of biomaterials such as metals, ceramics, polymers, and composites, along with their biocompatibility and functional properties. The lecture explored their use in medical implants, wound healing, and tissue regeneration strategies. It also highlighted how biomaterials support cell growth and tissue repair through advanced scaffolds and bioactive systems. Finally,

Details of Workshops & Seminars

emerging trends like smart biomaterials and regenerative medicine approaches were briefly discussed to show future directions in the field.

Figure.5. Seminar on Biomaterials in Modern Medicine: From Implants to Tissue

Introduction To Labview And Learn To Design And Develop Applications of Different Software-Based Virtual Biomedical Instruments

The workshop arranged for the students of batch 2024 IBET LUMHS at Computer & Telemedicine Lab IBET, LUMHS Jamshoro. To make them familiar with LABVIEW software to learn, design and develop applications of different software-based virtual biomedical instruments using LabVIEW software.

LabVIEW (Laboratory Virtual Instrument Engineering Workbench) is a graphical programming platform from NI (National Instruments) engineers use to develop automated production, validation, and research test systems and designed for accelerated test, measurement, and control applications. It uses "G" programming," a visual dataflow language, allowing users to drag-and-

Details of Workshops & Seminars

drop components, visualize parallelism, and connect with hardware, such as DAQ devices, instruments, and sensors. The purpose of this workshop is to make the students to understand and to build Application of different Virtual Biomedical Instruments using Virtual Instrument Engineering Workbench.

Figure.6. Introduction to LabVIEW and learn to design and develop applications of different software-based virtual Biomedical Instruments

20 Principles of Entrepreneurship

A seminar on *"Identifying & Evaluating Business Opportunities"* was conducted as part of the *Principles of Entrepreneurship* course. The session aimed to enhance students' understanding of how entrepreneurs recognize viable business ideas and assess their potential for success in real-world markets.

Figure.7. Seminar on &Evaluating Business Opportunities

Details of Workshops & Seminars

Analog Circuit Design for ECG Signal Filtering and Noise Minimization

This seminar focuses on the design and application of analog filters in electrocardiogram (ECG) signal processing, an essential aspect of biomedical engineering. ECG signals are often affected by various types of noise, including power line interference, baseline drift, and muscle artifacts, which can compromise the accuracy of diagnosis. The seminar was conducted at **IBET LUMHS** for **3rd year** Undergraduate students. Where discusses different types of filters low-pass, high-pass, band-pass, and notch filters and their roles in removing unwanted frequency components from the ECG signal. It also explains the basic principles of filter design using circuit analysis concepts such as RC circuits and frequency response. Overall, the seminar emphasizes how effective filtering techniques improve signal quality and contribute to reliable cardiac monitoring and diagnosis.

Figure.8. Few Clicks from Seminar Title "Analog Circuit Design for ECG Signal Filtering and Noise Minimization"

Seminar on the Role of Managers in Effective Communication

Communication is a core managerial function and a key determinant of organizational effectiveness. The seminar on "*Managers and Communication"* emphasized how effective communication empowers managers to plan, organize, lead, and control organizational activities with clarity, coordination, and efficiency.

Details of Workshops & Seminars

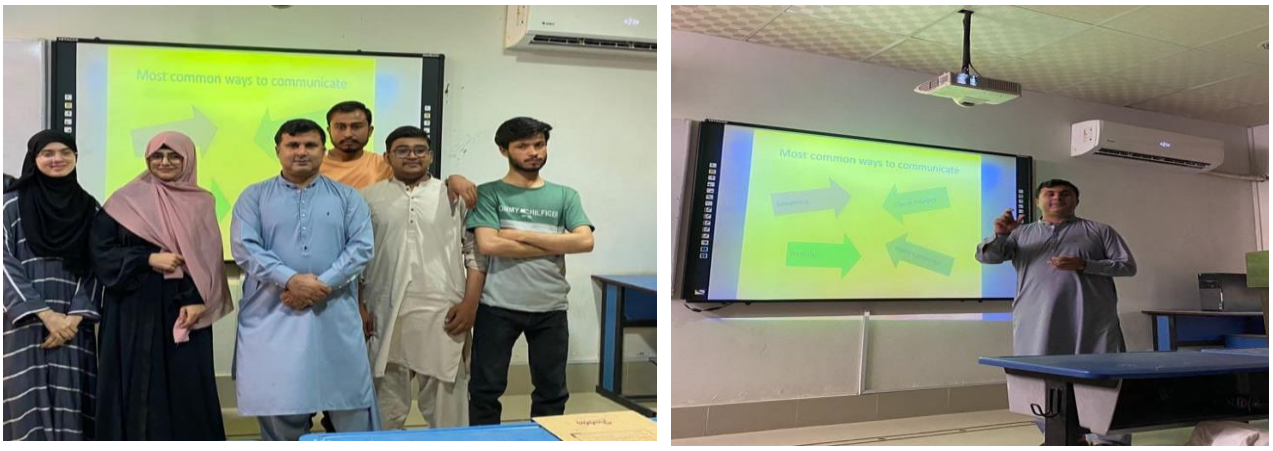

Figure.9. Seminar on the Role of Managers in Effective Communication

Bridging Clinical Needs and Technology: A Biomedical Engineer's Approach to Healthcare Management Systems

This Seminar was conducted at **Computer & telemedicine Lab, IBET LUMHS Jamshoro**. The seminar was organized for the Final year and Third year, BS students of Biomedical engineering. Detail introduction a biomedical engineers approach for healthcare management in hospital as well as in industries. This seminar was for biomedical engineers to train to treat technology as a clinical tool. We don't separate "the system" from "the patient." That mindset changes everything about implementation.

Figure.10. seminar on Bridging Clinical Needs and Technology: A Biomedical Engineer's Approach to Healthcare Management Systems

Details of Workshops & Seminars

Applications of Meta Quest 3 with Meta AI in Biomechanics: A Seminar on Immersive Analysis and Smart Rehabilitation

This seminar was conducted at **FAB Lab, IBET LUMHS Jamshoro** for the students of IBET LUMHS. The session focused on the applications of Meta Quest 3 integrated with Meta AI in the field of biomechanics. It provided participants with an understanding of how immersive technologies are utilized for motion analysis, rehabilitation, and human movement studies. Students explored interactive simulations and AI-driven tools to visualize biomechanical processes, analyze movement patterns, and understand smart rehabilitation techniques in a virtual environment.

Figure .11. Students actively engaging with Meta Quest 3 headset during the seminar, exploring immersive biomechanical simulations

From Flow to Force: Bio-fluid Mechanics, Biomechanics, and Applied Physics in Practice

This hands-on workshop was conducted at **Bio-Fluid Mechanics Lab, IBET LUMHS Jamshoro**. The hands-on workshop was organized for the students (from grade 9^{th}, 10^{th}, 11^{th} and 2ndyear) from Cadet College Petaro. This hands-on workshop provides an integrated understanding of how fluids and forces operate within biological systems. Participants will learn core concepts of Bio-fluid mechanics and biomechanics and engage with advanced physics equipment to measure, analyze, and interpret biological phenomena.

Details of Workshops & Seminars

Figure.12. Hands-on Workshop on From Flow to Force: Biofluid Mechanics, Biomechanics, and Applied Physics in Practice

Workshop on Arduino

A hands-on *Workshop on Arduino* was successfully conducted at IBET, LUMHS, providing students with an excellent opportunity to explore the fundamentals of embedded systems and electronics. The session attracted enthusiastic participation from students of various disciplines who were eager to gain practical skills in hardware programming and automation.

The workshop introduced participants to the basics of the Arduino platform, including circuit design, sensor integration, and programming using the Arduino IDE. Through guided demonstrations and live exercises, students learned how to build simple projects such as LED control systems, temperature sensing, and automation-based applications. Participants actively engaged in practical activities, which enhanced their understanding of microcontrollers and real-world problem-solving. The interactive nature of the workshop allowed students to experiment, ask questions, and develop confidence in working with electronic components.

Details of Workshops & Seminars

Overall, the workshop proved to be highly informative and skill-oriented, equipping students with foundational knowledge in Arduino and inspiring them to further explore innovation in embedded systems and technology development.

Figure.13. Hands-on Workshop on Arduino to explore the fundamentals of embedded systems and electronics

Physics in Everyday Life: The Science Behind the Ordinary

This seminar was conducted for first-year undergraduate students to highlight how physics plays an important role in everyday life. It focused on connecting basic concepts like motion, energy, electricity, and heat with daily activities such as walking, using appliances, and communication. Real-life examples and simple demonstrations were used to make the concepts easy to understand and engaging. The session also briefly discussed the importance of physics in biomedical engineering and healthcare technologies. Overall, the seminar helped students develop interest in physics by showing its practical applications in the real world.

Details of Workshops & Seminars

Figure.14. Seminar on Physics in Everyday Life: The Science Behind the Ordinary

Hands-on Physics: Exploring Fundamental Experiments and Measurements

This workshop was organized for first-year undergraduate students to provide practical exposure to basic physics concepts through experiments and measurements. The aim was to help students understand how theoretical knowledge is applied in laboratory settings. The session covered fundamental experiments related to measurement techniques. Interactive demonstrations allowed students to observe and understand principles of mechanics in a hands-on manner. The workshop emphasized the importance of experimental skills in scientific studies, especially in fields like biomedical engineering. Overall, the session enhanced students understanding by bridging the gap between theory and practical application, encouraging them to develop strong experimental and analytical skills early in their academic journey.

Details of Workshops & Seminars

Figure.15. Hands on Workshop on Physics: Exploring Fundamentals Experiments and Measurements

Unlock Your Research Super Power From Idea To Publication

The event titled *"Unlock Your Research Superpower: From Idea to Publication"* was successfully conducted at Indus Hotel Hyderabad, bringing together a diverse group of students and aspiring researchers. Participants from IBET LUMHS actively attended the session and demonstrated keen interest throughout the program.

The workshop focused on guiding participants through the complete research journey—from idea generation to publication in reputable journals. Expert speakers shared valuable knowledge on selecting research topics, structuring research papers, conducting literature reviews, and understanding the publication process. Students engaged in interactive discussions, asked insightful questions, and gained practical exposure to academic writing and research methodologies. The session proved highly beneficial in enhancing their understanding of research practices and motivating them to pursue scholarly work with confidence. Overall, the event was a great success, providing a meaningful learning platform and inspiring participants to transform their ideas into impactful research contributions.

Details of Workshops & Seminars

Figure.16. How to Focus on to Unlock from Research Super Power Idea to Publication

Hands-on Training in 3D Printing using Creality Systems

This hands-on workshop was conducted at the DSP & Microprocessor Lab, IBET, LUMHS, Jamshoro. The workshop was organized for third semester students (Batch 2024) of IBET LUMHS. This hands-on session provided a basic understanding of 3D printing technology. Participants learned the fundamental concepts of additive manufacturing and gained practical exposure to operating Creality 3D printers. The workshop focused on the printing process, including machine setup, material handling, and execution of 3D prints within the CAED lab environment.

Details of Workshops & Seminars

Figure.17. Practical demonstration of 3D printing technology using Creality printer

Hands-on with TDS and Multicolor 3D printing using Anycubic

The hands-on workshop was conducted at **Digital Signal Processing Lab, IBET LUMHS Jamshoro**. The TDS module introduced digital signal processing, focusing on core concepts such as signal representation, sampling, filtering, and basic processor-level understanding. Participants engaged with guided learning activities designed to build both theoretical insight and practical familiarity with DSP workflows. In parallel, the multicolor 3D printing session emphasized the transformation of digital designs into physical models. Participants gained hands-on experience in slicing, color mapping, printer setup, and material handling, enabling them to produce vibrant, multi-material prototypes. Together, the workshop bridged digital computation and physical fabrication, equipping participants with interdisciplinary skills in signal processing and advanced manufacturing, while fostering innovation, creativity, and applied learning.

Details of Workshops & Seminars

Figure.18. Hands-on Workshop on Hands-on with TDS and Multicolor 3D Printing using Anycubic

Introduction to MATLAB® for Biomedical Control System

The workshop arranged for the students of batch 2023 IBET LUMHS at **Computer & Telemedicine Lab IBET, LUMHS Jamshoro** to make them familiar with to MATLAB® for Biomedical Control System. MATLAB® and Simulink are widely used in biomedical engineering to design, simulate, and analyze control systems for medical devices, robotic surgery, and rehab equipment. It enables modeling transfer functions, implementing PID control, and validating AI algorithms, essential for developing regulatory-compliant therapeutic devices. Key applications include processing bio-signals and prototyping hardware via tools like the Control System Toolbox.

The purpose of this workshop is to make the students to understand and able to Create models for physiological systems (e.g., cardiovascular or insulin, glucose modeling) and design controllers using transfer functions or state-space models. Design image-based navigation for surgical robots and process images from MRI or CT scans. Implement control algorithms for devices such as ventilators, dialysis machines, and prosthetics. Use tools to filter and analyze biomedical signals (ECG, EMG, EEG) to use as feedback for control systems.

Details of Workshops & Seminars

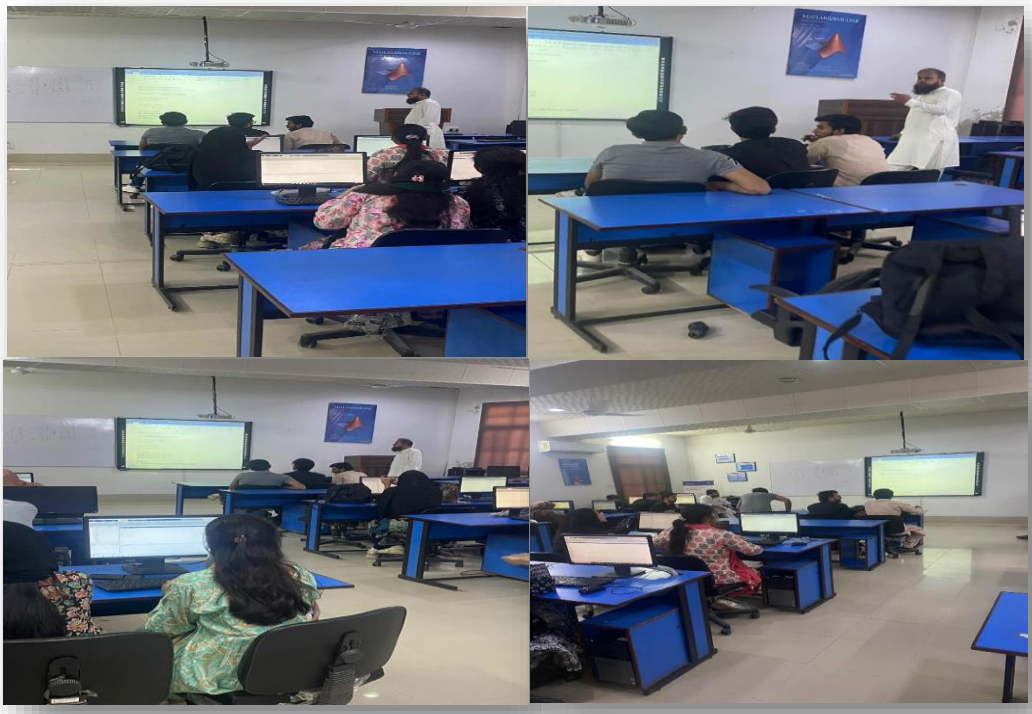

Figure.19 Introduction to MATLAB® for Biomedical Control System

Biomechanical Modeling of Human Organ Using SolidWorks and 3D Printing

This seminar was conducted at FAB Lab, IBET LUMHS Jamshoro for the BS Biomedical Engineering students. The seminar on Biomechanical Modeling of Human Organ Using SolidWorks and 3D Printing provided participants with an integrated understanding of digital design and physical prototyping in biomedical applications. The session covered the complete workflow, including 3D modeling of human organs using SolidWorks, design refinement, material considerations, and fabrication using 3D printing technologies. Students were introduced to applications in prosthetics, surgical planning, and anatomical replicas, along with discussions on model accuracy, limitations, and the role of additive manufacturing in advancing modern healthcare solution.

Details of Workshops & Seminars

Figure.20. Students observing a demonstration of biomechanical modeling and 3D printing during the seminar

Fundamentals of Machine Learning in Computer-Aided Diagnostics

This hands-on workshop was conducted at **Computer & telemedicine Lab, IBET LUMHS Jamshoro**. The hands-on workshop was organized for the Final year BS students of Biomedical engineering.

The Seminar on Fundamentals of Machine Learning in Computer-Aided Diagnostics introduced participants to the core concepts of artificial intelligence and machine learning in healthcare. The session covered the end-to-end workflow, including data collection, preprocessing, feature extraction, model selection, training, and evaluation. Students were exposed to examples from medical imaging and diagnostic systems, demonstrating how machine learning models can assist in detecting diseases at early stages. Basic tools and platforms were introduced to help students understand implementation aspects, along with discussions on model accuracy, limitations, and ethical considerations in AI-based healthcare solutions.

Details of Workshops & Seminars

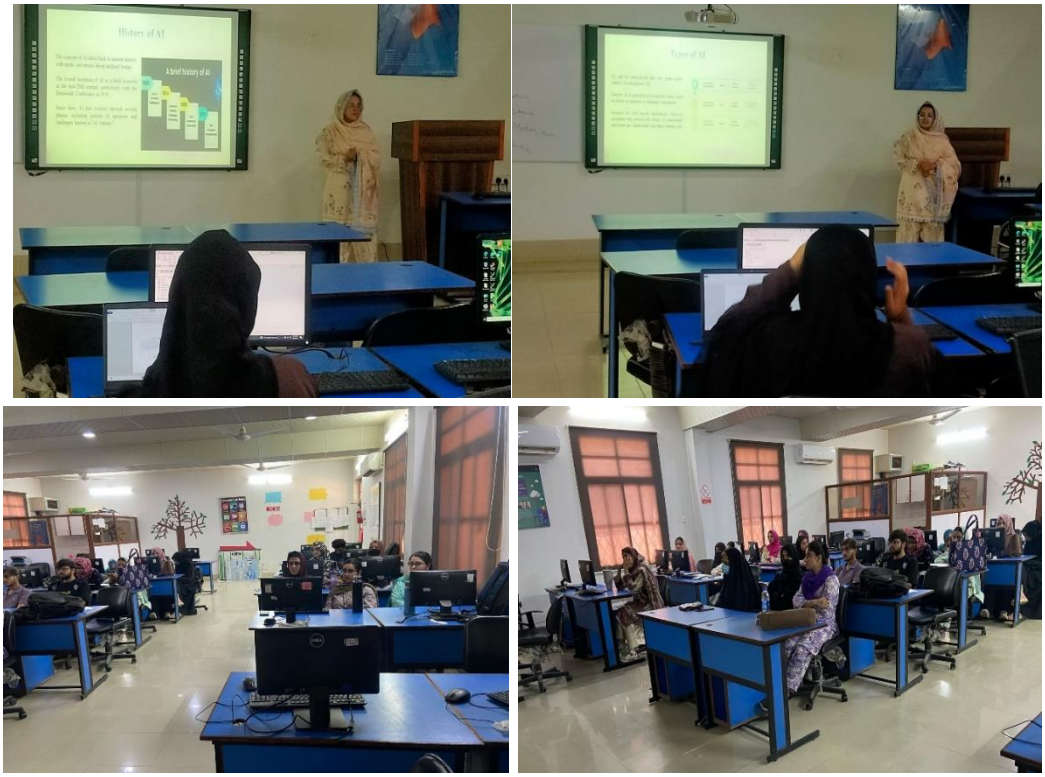

Figure.21. Seminar on Fundamentals of Machine Learning in Computer Aided

Fundamentals of Robotic Actions Used in the Modern Surgeries

This hands-on workshop was conducted at **Electrical and Electronics Lab, IBET LUMHS Jamshoro**. The hands-on workshop was organized for the Final year BS students of Biomedical engineering.

The **hands-on workshop on "Fundamentals of Robotic Actions Used in Modern Surgeries"** is designed as a one-day practical learning experience aimed at biomedical, engineering students, as well as beginners in healthcare. The workshop introduces participants to the core principles of robotic surgery, including basic robotic actions such as **linear movement, rotation, grasping, and precision control**, along with an overview of surgical robotic systems and their applications in minimally invasive procedures. Participants will engage in interactive sessions where they explore key components of robotic systems such as actuators, sensors, and controllers and understand concepts like degrees of freedom and coordinate systems. The workshop emphasizes hands-on learning through activities like assembling a basic robotic arm, programming it using platforms such as Arduino or Python, and executing fundamental tasks like pick-and-place operations. To simulate real surgical scenarios, participants will perform precision-

Details of Workshops & Seminars

based exercises such as tracing lines on soft materials, transferring small objects. By the end of the workshop, participants will have developed practical skills

Figure.22. Hands-on Workshop "Fundamentals of Robotic Actions used in Modern