भारत सरकार अधीन समविश्वविद्यालय

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Research and Consultancy Brochure
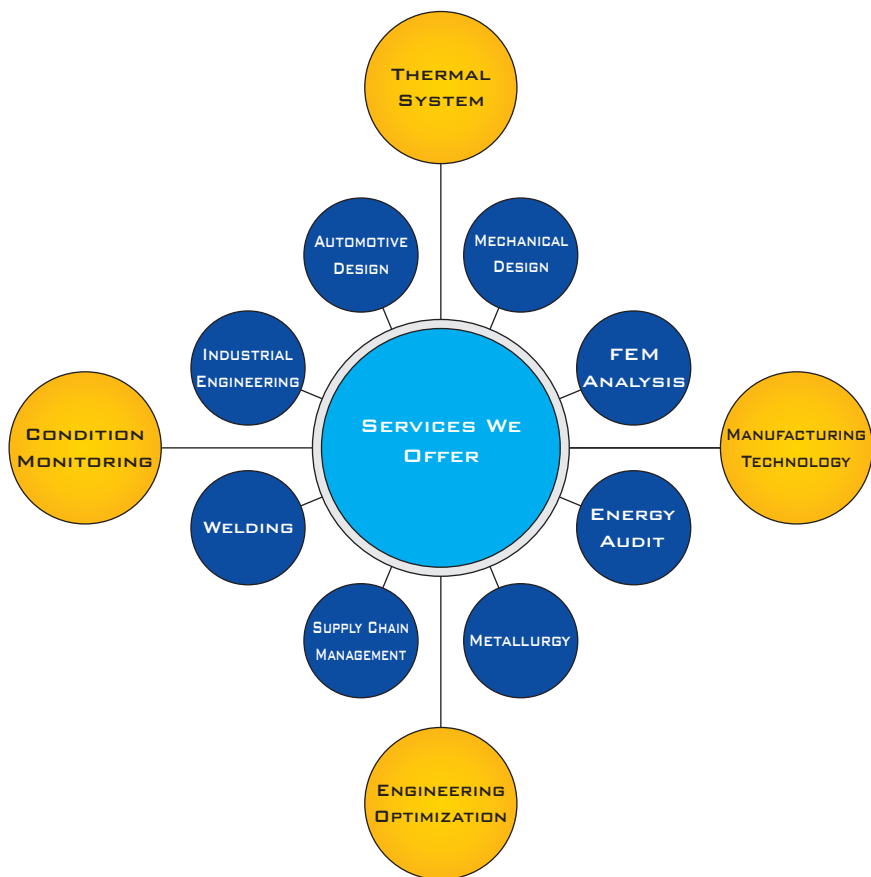
THINK
AND
INNOVATE

Sant Longowal Institute of Engineering and Technology
(Deemed to be University)
(CFTI under MHRD, Government of India)
Longowal 148106, Sangrur (Punjab) India

SLIET
Think Tank

- Thermal System
- Automotive Design
- Mechanical Design
- Industrial Engineering
- FEM Analysis
- Condition Monitoring
- **Services We Offer**
- Manufacturing Technology
- Welding
- Energy Audit
- Supply Chain Management
- Metallurgy
- Engineering Optimization

The institute was established by Ministry of Human Resource and Development (MHRD), Govt. of India in the year 1989 and was formally inaugurated on 20th December 1991, in the everlasting memory of the revered Saint Harchand Singh Longowal.

Institute has a vision to act as an international podium for the development and transfer of technical competence in academics. It is committed to provide best possible technical education and to cater to the technical manpower requirements with emphasis on multi-entry, multi-exit option.
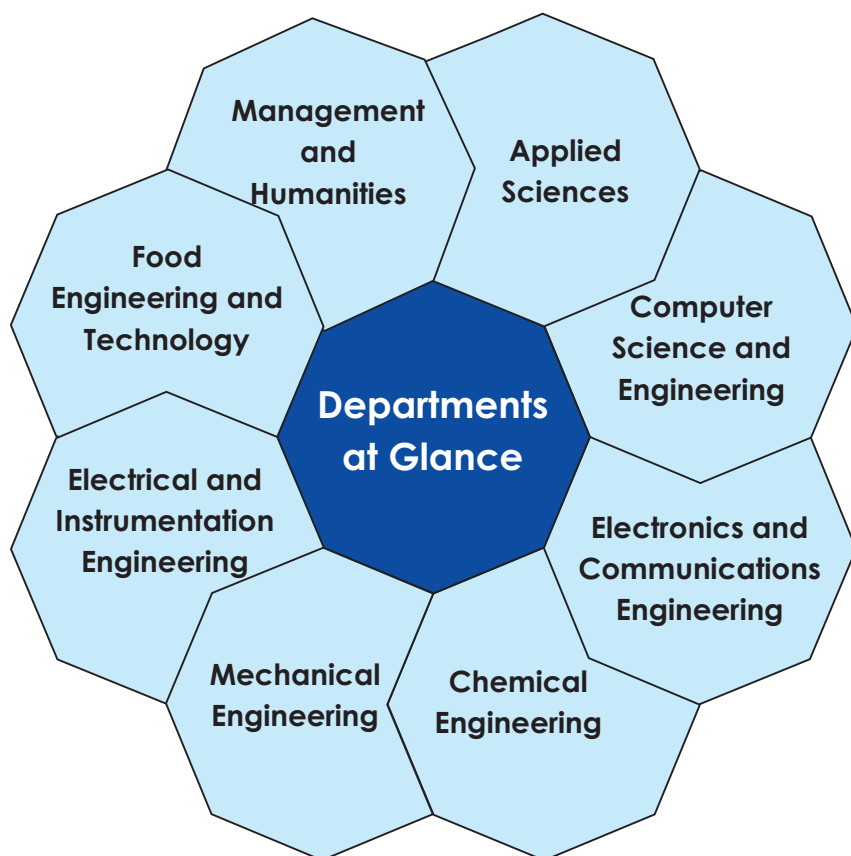
Institute offered the following programs:
- ICD (Integrated Certificate Diploma).
- Four year B.E. programmes (through JEE).
- B.E. programmes (through Lateral Entry/SET-III).
- M.Tech. programmes (through CCMT/Valid GATE Score/SET).
- M.Sc. programmes (through CCMN/PUCET (PG)/JAM/CUCET/SET).
- Ph.D. programmes (admissions as per UGC guidelines/SET-V).

Management and Humanities

Applied Sciences

Food Engineering and Technology

Computer Science and Engineering

Departments at Glance

Electrical and Instrumentation Engineering

Electronics and Communications Engineering

Mechanical Engineering

Chemical Engineering

SLIET
Department of
Mechanical Engineering

Department Offers

- ICD programme in Mechanical Engineering (DME) with certificate programme in
  - Welding (CWG)
  - Foundry and Forging (CFF)
  - Tool & Die Technology (CTD)
  - Auto & Farm Equipment Mechanic (CAF)
  - Air Conditioning Mechanic (CAC).
- B.E. programme: Mechanical Engineering.
- M.Tech. programme: Manufacturing Systems Engineering and Welding and Fabrication.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- Thermal Systems and Energy Audit
- Mechanical Design and FEM Analysis
- Condition Monitoring of Rotary Machines
- Design of welding procedures for different materials
- Weld quality assurance for different fabrications
- Materials joining by welding and Metallurgy
- Engineering Optimization for different manufacturing operations
- Industrial Engineering, Quality Management, TPM, 5S, SCM
- Automotive Design
- Manufacturing Technology

Where we can help

- ✓ Thermal Systems and Energy Audit
- ✓ Mechanical Design and FEM Analysis
- ✓ Condition Monitoring and fault diagnosis
- ✓ Welding & Metallurgy
- ✓ Engineering Optimization
- ✓ Industrial Engineering, Quality Control,
- ✓ TPM, SCM
- ✓ Automotive Design and Manufacturing
- ✓ Processes

Contact: Head, Department of Mechanical Engineering
hodme@sliet.ac.in | 01672-253124

SLIET
Department of
Computer Science and Engineering

- ICD programme in Computer Science & Engineering (DCS) with certificate programme in
  - Data Entry & Word Processing (CDE).

- B.E. programme: Computer Science & Engineering.
- M.Tech. programme: Computer Science and Engineering.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- Pattern Recognition
- Image and Signal Processing
- Natural Language Processing
- Cloud Computing
- Communication Networks
- Wireless and Mobile Network
- Machine Learning
- Big Data Analytics

Where we can help

- ✓ Web development and site management
- ✓ Mobile applications development
- ✓ Data analytics
- ✓ Machine learning

Contact: Head, Department of Computer Sc. and Engineering
hodcse@sliet.ac.in | 01672-253122

SLIET
Department of Electronics and Communication Engineering

Department Offers

- ICD programme in Electronics & Communication Engineering (DEC) with certificate programme in
  - Television Mechanic (CTV)
  - Servicing & Maintenance of Electronic Instruments (CSME).
- B.E. programme: Electronics & Communication Engineering.
- M.Tech. programme: Electronics & Communication Engineering.
- Ph.D. (Full-time/Part-time)

Thrust Areas

- Electromagnetic Design and Analysis
- RF Microwave and Antenna Design
- Bio-Electromagnetics
- Nanomaterials
- Terahertz Communication
- Optical Fiber Communication
- Wireless Communication & sensing network
- Embedded System Design
- Internet of Things
- Nano-Photonics Based Antenna Design
- VLSI Circuit Design
- Micro and Nano Photonic Based Circuit
- Design
- FEM Modeling Based Approach
- Biomedical Applications
- Digital Circuit Design

Where we can help

- ✓ Intelligent Systems & Image Processing
- ✓ Microwave and Antenna Design
- ✓ Broadband & Optical Communication
- ✓ Bio-Electromagnetics, Nanoscale Design
- ✓ VLSI Design
- ✓ Embedded System & Wireless Sensor Network

Contact: Head, Department of Electronics and Communication Engineering
hodece@sliet.ac.in | 01672-253118

SLIET
Department of Electrical and Instrumentation Engineering

Department Offers

- ICD programme in Instrumentation & Process Control (DIN) and Electrical Engineering (DEE) with certificate programme in
  - Servicing & Maintenance of Medical Instruments (CSMM)
  - Electrician (CEN).
- B.E. programme: Electrical Engineering and Instrumentation & Control Engineering.
- M.Tech. programme: Electrical Engineering and Instrumentation & Control Engineering.
- Ph.D. (Full-time/Part-time)

Thrust Areas

- Biomedical Engineering
- Design of Electromagnetic Devices
- Power System
- Industrial Electronic and Power Quality
- Instrumentation and Control
- Automation

Where we can help

- ✓ Department has well established research groups in diversified areas and enlisted as:
- ✓ Power system: Load dispatch considering non-conventional energy sources, viz, Solar, Wind, etc.; Power system Protection; Smart grid and data analytics for the same.
- ✓ Electrical machines analysis and design: Design of custom machines specific to the application; Finite element analysis of Electrical machines.
- ✓ Power electronics and drives: Electric Drives design and analysis; Drives specific to electric vehicles; FACTS devices.
- ✓ Power quality: Detailed Analysis of Electrical power according to the standards; Fault analysis and prediction of contingency generated with fault.
- ✓ Bio-medical engineering: Design of biomedical equipment; Biomedical signal and image processing for disease diagnosis; Application of data analytics to the large volume biomedical data.
- ✓ Automation (Wired and wireless): Wireless sensor networks; Application of wireless techniques to the existing systems to automate them.
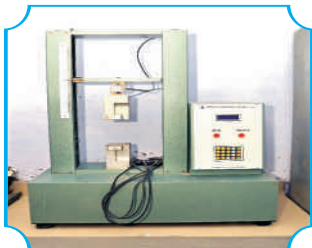
Contact: Head, Department of Electrical and Instrumentation Engineering
hodeie@sliet.ac.in | 01672-253120

SLIET
Department of
Chemical Engineering

Department Offers

- ICD programme in Chemical Technology (DCT) with certificate programme with certificate programme in
  - Paper Technology (CPT).
- B.E. programme: Chemical Engineering.
- M.Tech. Programme: Chemical Engineering.
- Ph.D. (Full-time/Part-time)

Thrust Areas

- Industrial Pollution
- Control
- Waste water treatment
- Solid waste treatment
- Lignin valorization
- Energy conservation and
- audit
- Biochemical Engineering
- Paper Technology
- Polymer Technology
- Process Modelling and Simulation

Where we can help

- ✓ Air pollution control
- ✓ Waste water treatment
- ✓ Solid waste management
- ✓ Energy conservation and audit
- ✓ Biochemical engineering
- ✓ Paper technology
- ✓ Process modelling and simulation
- ✓ Lignin valorisation
- ✓ Super Critical Fluid Extraction

Contact: Head, Department of Chemical Engineering
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SLIET
Department of
Food Engineering and Technology

Department Offers

- ICD programme in Food Technology (DFT) with certificate programme in
  - Food Processing & Preservation (CFP).
- B.E. programme: Food Technology.
- M.Tech. programme: Food Engineering & Technology.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- Engineering properties of food
- Functional foods and dehydration techniques
- Green extraction technology
- Value addition and nutrient enhancement
- Food product development
- Design and fabrication of food processing equipment
- Traditional foods with value addition
- Instant food beverages and designer foods
- Pre-/pro-biotic food products
- Gulten-free food products
- Utilization of pseudo-cereals
- Pollen characterization and honey processing
- Downstream processing
- Isolation and characterization of starch & protein
- Modification of starch
- Biodegradable films

Where we can help

R&D with industry in the industry -Institute partnership for:
- ✓ Processing of conventional to designer foods
- ✓ Processing and Utilization of Pseudo-cereals
- ✓ Development of pre-/pro-biotic and gluten-free food products
- ✓ Value addition of food industry by-products
- ✓ Biodegradable films and edible Coating of food products
- ✓ Food Quality testing and certification
- ✓ Food Adulteration detection
- ✓ Non-destructive approaches in Food quality evaluations

Contact: Head, Department of Food Engineering and Technology
hodft@sliet.ac.in | 01672-253130

Department of Chemistry | Department of Applied Sciences

Department Offers

- M.Sc. programme in Chemistry.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- Nano Material Synthesis
- Natural Products
- Organocatalysis
- Heterocyclic Chemistry
- Organometallic Chemistry
- Computational Chemistry

Where we can help

✓ The department has well equipped sophisticated lab with all type of major equipment for the research areas including synthesis and characterization of novel compounds, nanostructures, supramolecular structures, natural products, heterocyclic chemistry, environmental science and molecular modelling.

✓ The department has many major sophisticated instruments like FTIR-Spectrophotometer, UV-Vis spectrophotometer, Florescence Spectrophotometer, CHN Analyser, Digital Tensiometer, Water Purification System, HPLC, Polarimeter, Potentiometric Auto Titrator, Ion selective Electrode, ISA Ultra filtration membrane, Nitrogen Gas Generator, Rotary Evaporator, Ultrasonic processor, Microwave Synthesizer, Centrifuge machine, Fluorescence Spectrophotometer, Incubator Shaker, Filtration Kit and GCMS.

Contact: Head, Department of Chemistry
hodchem@sliet.ac.in | 01672-253129

SLIET

DEPARTMENT OF APPLIED SCIENCES | DEPARTMENT OF PHYSICS

Department Offers

- M.Sc. programme in Physics.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- DFT application to Condensed Matter Physics
- Plasmonics
- Radiation Physics
- Material Synthesis and their characterization
- Atomic & Molecular Physics
- High Energy Physics
- Material Science

Where we can help

- ✓ Dielectric measurement
- ✓ Irradiation studies
- ✓ Vibrational, electronic, structural and thermal properties of material through DFT
- ✓ Optical properties of different materials at nano levels

Contact: Head, Department of Physics
hodphy@sliet.ac.in | 01672-253131

Department of Mathematics | Department of Applied Sciences

Department Offers

- M.Sc. programme in Mathematics.
- Ph.D. programme (Full-time/Part-time)

Thrust Areas

- Geometric Function Theory
- Operator Theory and Linear Algebra
- Wavelet Methods
- Astrophysics and Space Science
- Cosmology
- Financial Mathematics
- Mathematical Modelling
- History of Mathematics
- Numerical Laplace Transforms
- Matrix Analysis of Magic Squares and Fibonacci like Sequences

Where we can help

- ✓ Mathematical Modelling of Industrial Problems
- ✓ Relativistic Cosmology
- ✓ Optimization Techniques
- ✓ Approximation Theory
- ✓ Cryptography
- ✓ Fast Numerical Algorithms

Contact: Head, Department of Mathematics
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SLIET
CENTRAL INSTRUMENTATION FACILITY

X-ray Diffractometer (XRD) is an important tool for R&D and in production control in industries. It has wide range of application areas including: Material Science, Geology, Pharmaceuticals, building materials, Forensic, Mining, and Cement Industries. X-ray diffraction is a high tech, non-destructive technique for analyzing a wide range of materials including fluids, metal, minerals, polymers, catalyst, plastics, ceramics, pharmaceuticals- new compounds, thin film coatings and semiconductors. Throughout industries and research institutions, X-ray diffraction has become indispensable method for material investigation, characterization and quality control.

Bruker D8 Advanced X-ray diffractometer available as Central Facility in the institute and having following features can easily accommodate all X-ray diffraction applications, such as, structure determination, phase analysis (qualitative and quantitative), stress and texture measurement, Thin film analysis and small angle

Make/Model	Bruker AXS D8 Advance
Configuration Geometry	Vertical Theta/2Theta
Maximum Usable angular range	150°
X-ray source	Cu, wavelength 1.5418 Å
Detector	LYNXEYE XE

Where we can help

- ✓ Powder Diffraction data
- ✓ Profile fitting and Indexing
- ✓ Degree of crystallinity
- ✓ Rietveld analysis
- ✓ Strain analysis
- ✓ Qualitative and quantitative phase analysis
- ✓ Thin film analysis
- ✓ Residual stress measurement
- ✓ Texture analysis
- ✓ Small angle x-ray scattering
- ✓ Softwares (TOPAS, DIFFRAC.EVA, LEPTOS, SAXS) support is available for all kind of applications mentioned above along with PDF2 database.
- ✓ Sample requirement: 2 gm fine powder sample or bulk sample having dimensions 6 cm x 5.2 cm and thickness 0.2 cm with uniform plane surface is required for taking diffractogram.
- ✓ Result can be presented in intensity/ count vs. 2-theta position with peak position, d-value, FWHM and relative intensity.

Contact: Chairman, Central Instrumentation Facility
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SANT LONGOWAL INSTITUTE OF ENGINEERING AND TECHNOLOGY
DEEMED TO BE UNIVERSITY
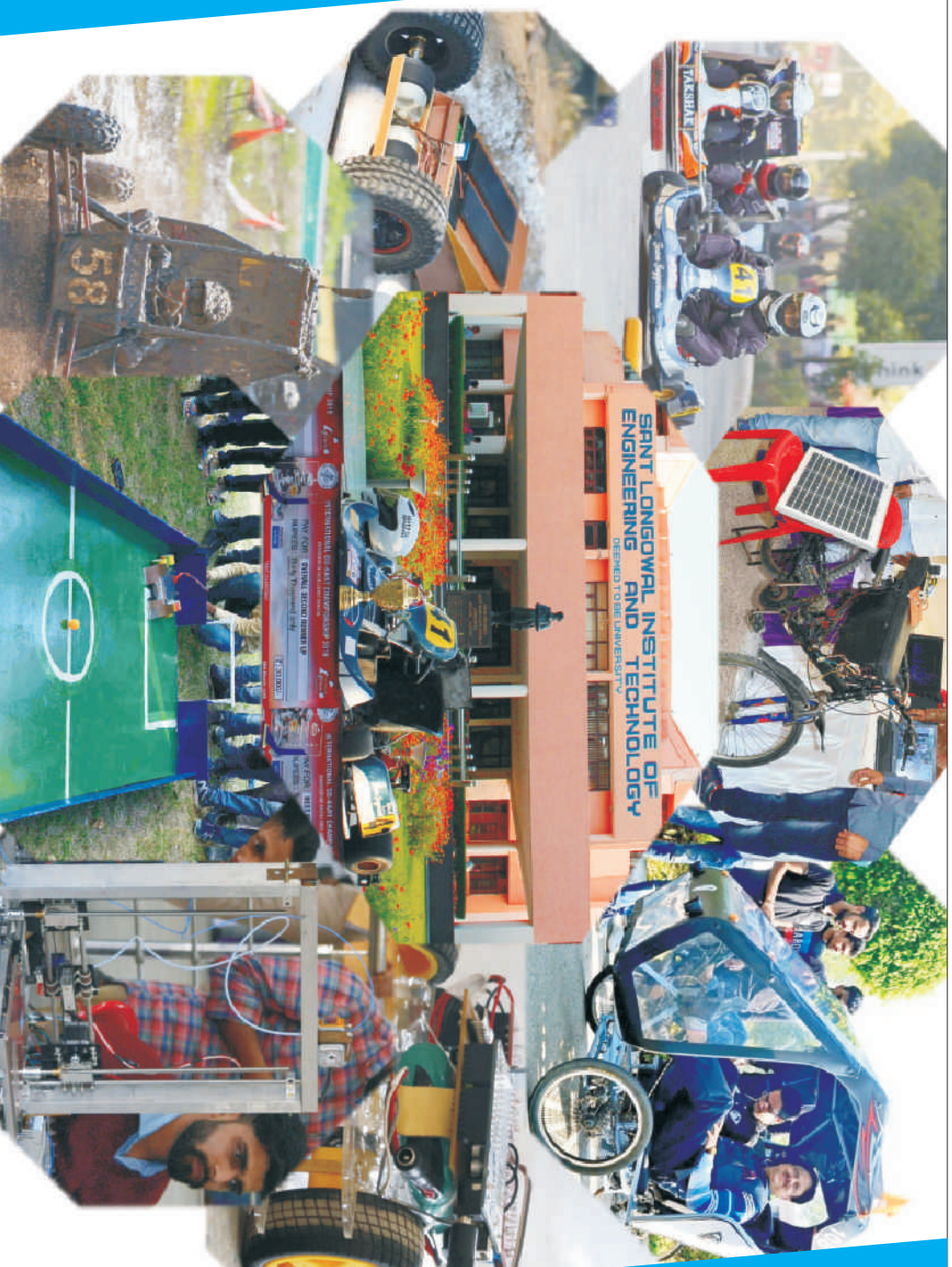
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