



KUMARAGURU
COLLEGE OF TECHNOLOGY

NAAC (National Assessment and Accreditation Council)

A^{GRADE}++

DST-FIST CENTRE FOR MATERIALS CHARACTERIZATION

S p o n s o r e d B y

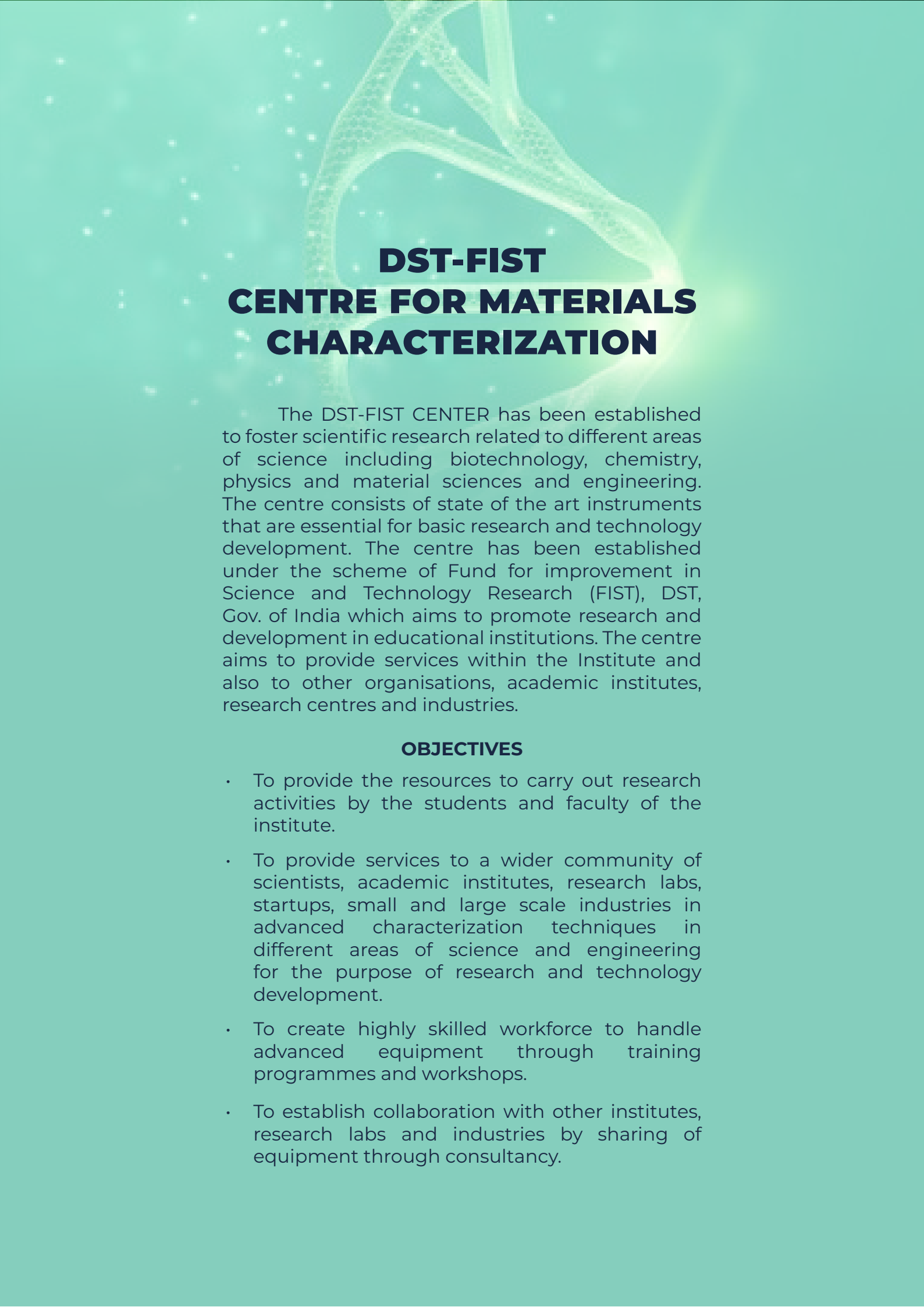
Department of Science And Technology (DST),
Government of India



Kumaraguru College Of Technology

Kumaraguru College of Technology (KCT), Coimbatore is a private Engineering College started in 1984 under the auspices of Ramanandha Adigalar Foundation, a charitable educational trust of Sakthi Group. Situated in a sprawling 156-acre campus in the IT corridor of Coimbatore, KCT is an autonomous institution affiliated to the Anna University, Chennai and approved by All India Council for Technical Education (AICTE). KCT was granted Five Year Accreditation status in its first cycle of accreditation. Later, in the second cycle, with a CGPA of 3.21 on 4.0 scale, A Grade was awarded which was valid till 02 December 2021. In July 2022, following the NAAC Peer Team visit for third cycle of accreditation, KCT has been awarded A++ Grade, the highest grade awarded to institutions by NAAC with KCT securing a CGPA of 3.62 on a 4 – point scale. And all the eligible UG programs have also been accredited by National Board of Accreditation (NBA).

The able guidance and patronage of Arutselvar Dr. N. Mahalingam, Founder, Sakthi Group along with the efficient administration of Dr. B. K. Krishnaraj Vanavarayar, Chairman, the resourcefulness of Sri. M. Balasubramaniam, Correspondent and the foresightedness of Sri. Shankar Vanavarayar, Joint Correspondent have equipped the college with excellent facilities such as spacious classrooms, seminar halls, well-equipped laboratories, excellent sporting amenities, dedicated high-speed internet connectivity (broadband) and well-qualified faculty.



DST-FIST CENTRE FOR MATERIALS CHARACTERIZATION

The DST-FIST CENTER has been established to foster scientific research related to different areas of science including biotechnology, chemistry, physics and material sciences and engineering. The centre consists of state of the art instruments that are essential for basic research and technology development. The centre has been established under the scheme of Fund for improvement in Science and Technology Research (FIST), DST, Gov. of India which aims to promote research and development in educational institutions. The centre aims to provide services within the Institute and also to other organisations, academic institutes, research centres and industries.

OBJECTIVES

- To provide the resources to carry out research activities by the students and faculty of the institute.
- To provide services to a wider community of scientists, academic institutes, research labs, startups, small and large scale industries in advanced characterization techniques in different areas of science and engineering for the purpose of research and technology development.
- To create highly skilled workforce to handle advanced equipment through training programmes and workshops.
- To establish collaboration with other institutes, research labs and industries by sharing of equipment through consultancy.

FLUORESCENCE SPECTROMETER

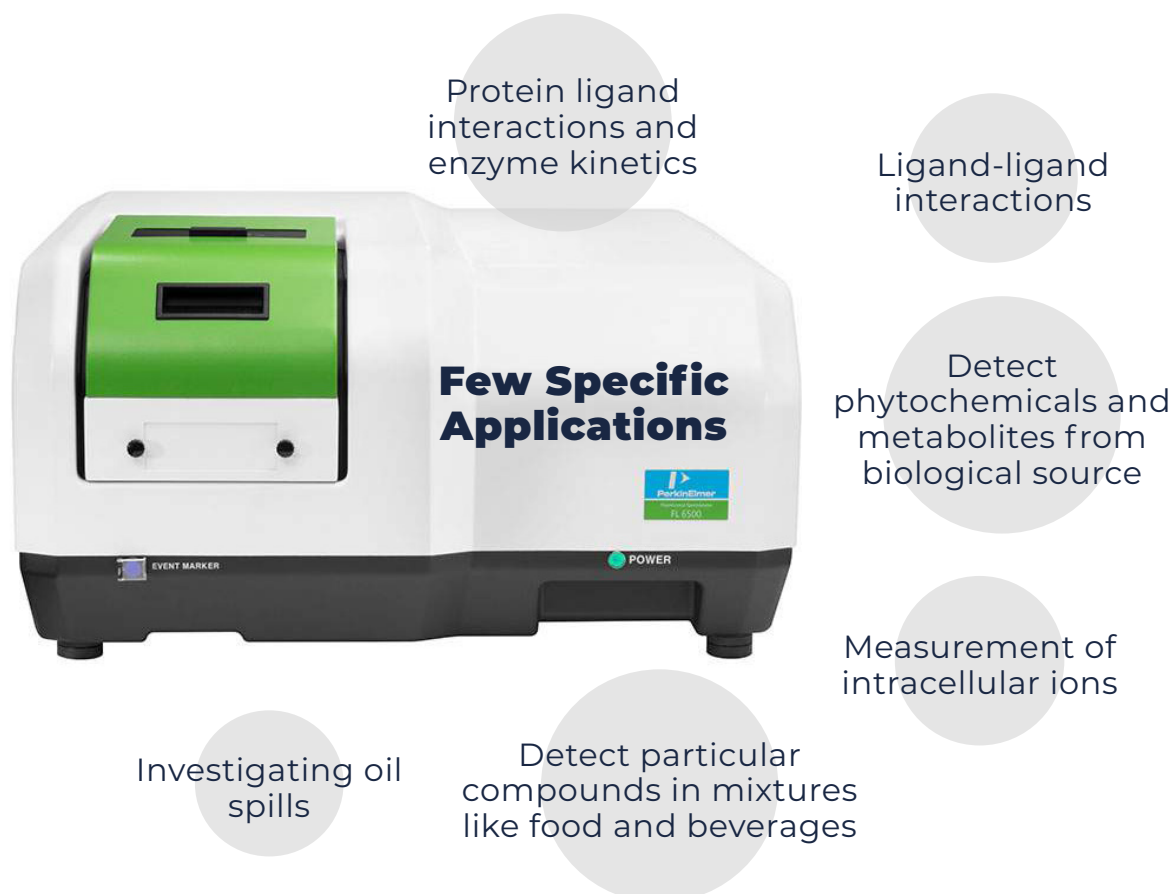
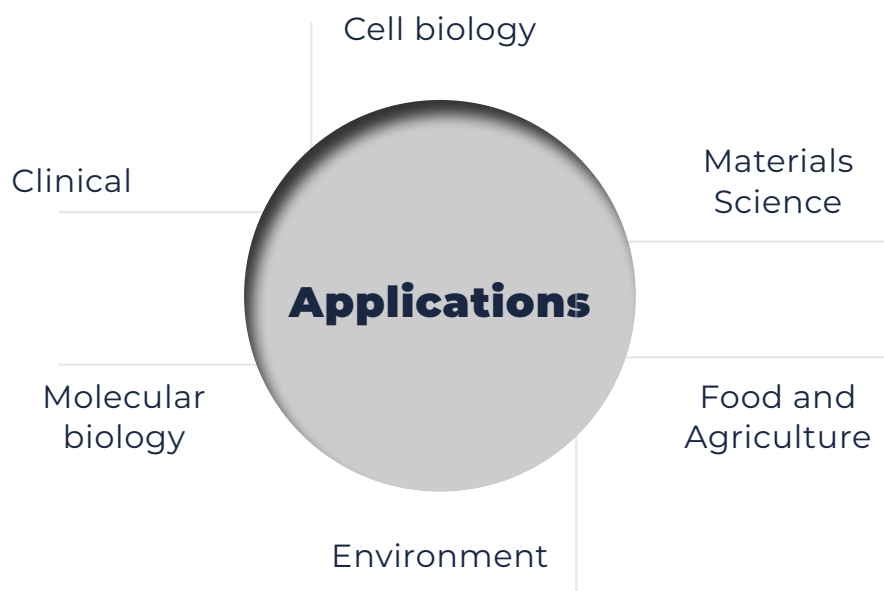
MAKE : PERKIN ELMER

MODEL : FL 6500

The fluorescence spectrophotometer FL 6500 generates reliable and accurate information of molecules with ease and is user friendly. Determination of compounds based on fluorescence property of molecule.



Ability to study the defect states of materials for understanding the nature of material. Ideally suited for thin coatings, nanoparticles, quantum dots, cell-biology, immunology, molecular biology, enzymology and tissue, DNA and protein analysis. Enables analysis of different samples comprising solid, liquid, glass and thin film.



SIMULTANEOUS THERMAL ANALYSER

MAKE : PERKIN ELMER

MODEL : STA 8000

The STA 8000 is capable of real time measurement and analysis of sample weight change and heat flow.

Maximum heating rate of 100 °C/min up to 1000 °C and 25 °C / min up to 1200 °C (0.1 °C / min increments)

Simultaneous analysis of TG with DTA mode (delta T) and DSC (mW) mode for fast enhanced result interpretation.

Easy to operate software with different user defined thermal programs enables accurate and reliable data generation with simple interpretation.

- Differential Temperature Analysis – DTA (Temperature difference)
- DSC (heat flow)
- Thermogravimetric Analysis (TGA-weight change) can be performed in the same instrument.

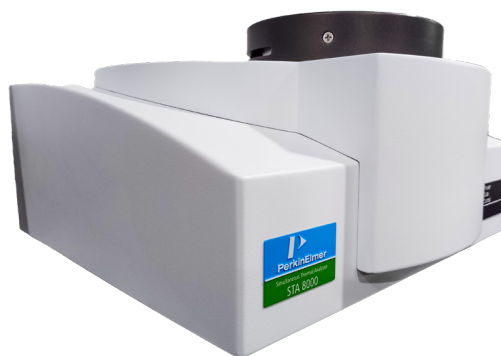
- Heating and cooling measurements.
- Temperature scan and isothermal programs.
- Can operate at temperatures from RT to 1200 °C.

APPLICATIONS

STA 8000 provides high temperature applications including characterization of inorganics, analyzing polymers and testing oils. Thermostability of organic and inorganic compounds including alloys and metals. To assess the oxidative stability of the materials for effective product development. To monitor behavioral changes of compounds at different temperatures to optimize process parameters, to check purity of compounds, pharmaceuticals and complexes and grade of polymers, rubber and metals to name a few.

From TGA

- Compositional analysis
- Decomposition temperatures
- Engine oil volatility
- Flammability studies
- Lifetime predictions
- Measurement of volatiles
- Oxidative and thermal stabilities
- Catalyst and coking studies
- Hyphenation to identify out-gassing products



to DTA/DSC

- Melting and crystallization behavior
- Glass transition temperatures,
- Specific heat capacity
- Kinetic studies
- Transition and reaction enthalpies.

CONTACT ANGLE METER

MAKE : DATAPHYSICS

MODEL : OCA 11

OCA 11 is a high precision optical device to measure the interfacial parameters and phenomena. It is used for contact angle measurements, drop shape analysis and to determine surface tension of liquids and surface free energy of substrates.

Instrument Features

- Has a fast 6.5 fold zoom lens with manual focus and a USB3 camera which delivers pin sharp images and easy analysis with software.
- Video based dynamic contact angle measurement with precise and reliable results.
- Capable of slow-motion observations up to 3200 FPS enabling analysis of really fast processes.
- Continuously updated software for updated features with ease of use.
- Tilting range of -5° to 95° ($\pm 0.1^{\circ}$) and tilting speed of $0.12^{\circ}/s$ to $12^{\circ}/s$ for drop roll analysis.

Measurements

- Contact angle measurement range of $0-180^{\circ}$
- Accuracy of $\pm 0.1^{\circ}$
- Resolution of $\pm 0.01^{\circ}$
- Surface and interfacial tension, surface free energy measuring range of $0.01 - 2000 \text{ mN/m}$ and resolution of $\pm 0.01 \text{ mN/m}$.
- Comprises of single and double dosing system which can dispense liquids with electronic syringe modules (also controlled by software).
- Sessile drop to measure contact angle of liquids and surface free energy of substrates.
- Pendant drop to measure surface tension of liquids (liquid-air interface)

Applications

- To check hydrophilic and hydrophobic nature (wettability) of substrates.
- Determination of free energy parameters.
- To measure surface free energy of materials.
- Determining surface tension of liquids.
- For research, quality assurance and process optimization.

Used in various disciplines of research comprising

- Textile
- Nanotechnology
- Pharmaceuticals
- Material Science
- Biotechnology
- Bio-medical
- Display panel and plastic industry
- Hard drives
- Semiconductors
- Paint industry



FOURIER TRANSFORM INFRARED SPECTROPHOTOMETER

MAKE : SHIMADZU
MODEL : IRAffinity-1S

The Fourier Transform InfraRed Spectrophotometer measures an infrared spectrum by Fourier-transform of an interferogram.

- High signal to noise ratio
- High sensitivity measurement.
- Higher speed measurement
- He-Ne laser generating high wavenumber accuracy.
- Measures samples with low transmittance, small sample size, or a thin layer of film on its surface.
- Higher accurate spectrum subtraction.

- The interferometer is continuously optimized by a dynamic alignment mechanism
- Built-in auto dryer helps ensure ease of maintenance
- Maximum resolution of 0.5 cm^{-1}
- High-performance LabSolutions IR software, which emphasizes operability, and analysis support programs make it easier to perform data processing and analysis

- MIRacle 10 ATR with Zinc Selenide crystal measures spectrum of different sample types including solid, semi-solid, powder, liquid, thin film and coatings.
- Single-reflection ATR accessory with incident angle of 45° .
- No need for sample preparation. Has a wavelength range of 400 cm^{-1} to 4000 cm^{-1} .

To Determine Qualitatively And Quantitatively

- Bond vibrations
- Molecular interactions
- Bond characteristics
- Contaminants
- Sample purity
- Compound modifications
- Functional groups
- Material identification

Applications

Application Sectors

- Automobiles
- Metals
- Construction
- Electricity, Electronics,
- Food Products
- Chemicals and Polymers
- Cosmetics
- Medicine
- Semiconductors



Contact:

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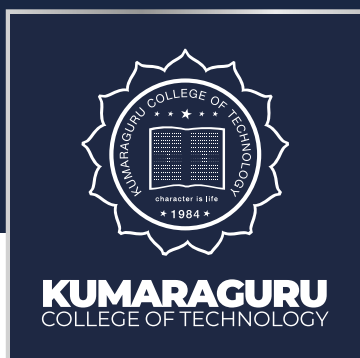
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Spectrometer**

Click here to submit for
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Click here to submit for
**Contact
Angle Meter**

Click here to submit for
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Spectrophotometer**



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