



शिक्षा मंत्रालय  
MINISTRY OF  
EDUCATION

सत्यमेव जयते

# GIAN Course on Organic Electronic Materials and Devices

April 21<sup>st</sup> to 25<sup>th</sup>, 2025

Organized by: Department of Chemistry, National Institute of Technology, Tiruchirappalli-620015, India.

## About GIAN:

The Government of India, through the Ministry of Education, has initiated a scheme, Global Initiative of Academic Networks (GIAN), to increase the footfall of reputed international faculties in Indian academic institutes, augment the country's existing educational resources, and elevate India's scientific and technological capability to the global level.

## NIT Trichy:

The National Institute of Technology, Trichy, is a premier Technical Education Institution that offers courses in Engineering and Technology, Science, Management, Architecture, and Social Sciences. NIT Trichy is ranked first among all NITs nationwide and secured 9<sup>th</sup> position in Engineering in the India Rankings 2024 released by NIRF, Government of India.

## Overview and Importance of the Course:

Organic electronics is an exciting and emerging field that can transform the current silicon-based electronic technologies into lightweight, flexible electronic devices such as building-integrated lighting, foldable displays, and printable solar cells at low cost. Unlike conventional inorganic semiconductors, organic electronic materials are composed of organic (carbon-based) small molecules or polymers using synthetic strategies developed using organic and polymer chemistry. A primary motivation for organic electronic materials is the ability to use them in printing technologies via various electronic devices such as organic light emitting devices, organic photovoltaics, field effect transistors, and circuits, economically.

Students, professors, and researchers in the fields of chemistry, electrical engineering, and chemical engineering explore the chemical and electronic properties of organic materials and various applications of this cutting-edge technology for the development of next-generation electronic devices for a sustainable future. The course will be planned and offered as per the norms set by NIT-Trichy for Chemistry and Chemical Engineering subject.

## Objectives:

This course aims to understand relevant fundamental scientific concepts and its relationship to organic semiconductors, photophysics, and charge transport of organic materials, as well as challenges and recent developments in advanced materials and practical applications. This course covers diverse topics, including current and next-generation organic electronics technologies such as displays, organic light emitting devices (OLED), transistors, solar cells, photodetector and sensor devices, concepts, research and development, and products.

The main topics covered during the lecture,

1. Electronic structure and photo-physics of organic semiconductor.
2. Excitonic process and charge transport in organic semiconducting materials.
3. Aspect of OLED mechanism and organic photovoltaics device physics.
4. Overview of current and future flexible electronics technologies.

## Topics Discussed:

- Introduction to organic electronics and electronic structure of organic semiconductors.
- Problem-solving session: determination of electronic energy level of organic semiconductor materials.
- Electronic conduction and charge transport in organic semiconductors.
- Problem-solving session: Conductivity and mobility calculation of organic molecules in solid state.
- Organic semiconductor for Organic Field-Effect Transistor (OFET) devices.
- Problem-solving session: Determination of OFET device characteristics and organic solar cell efficiency.
- Organic light-emitting devices – working principles and devices.
- Organic photovoltaics: Current status of materials development and device fabrication.
- Dye-Sensitized Solar Cells (DSSC): Theory, fabrication and current scenario.
- Perovskite solar cells (PSC): an overview.

## Will be beneficial for:

- ✓ Students at all levels (PG/MS/PhD/PDF) with both science and engineering backgrounds.
- ✓ Faculty from reputed academic institutions and industries working in the area of Alternative fuels.

## Course fee:

Type / Nationality	Indian	Abroad
Student / Scholar	₹ 1000	\$ 200
Faculty	₹ 3000	\$ 300
Scientist / Industrial Participant	₹ 5000	\$ 500



The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, working lunch, and refreshments.

The participants may be provided accommodation, depending on hostel availability, on an additional payment basis.

**\* The number of participants for the course will be limited to fifty.**

**\* The last date for registration is 24-03-2025 (Monday till 05:30 pm).**

**\* The participants should register for the course, and once they are shortlisted, they are asked to pay the fee. The shortlisted candidates will receive a mail with the payment procedure on/before 31-03-2025 (Monday).**

**Registration Link:** <https://forms.gle/geN9j6Q56ra21WFE8>

## Payment Procedure: (Only for shortlisted participants)

**Indian participants:** Go to State Bank Collect (<https://www.onlinesbi.sbi/sbicollect/>) → Search for: Conference and Workshop NIT Trichy → select payment Category: GIAN OEMD 2025 and provide details of payment and submit.

**International Participants:** (Required to make the course fee payment via SWIFT transfer) Account Details for SWIFT Transfer: Account Number: 38322028974, Account Name: Director, NIT-Tiruchirappalli, SWIFT Code: SBININBB190, Bank Name: State Bank of India.

### Course Coordinator:

Dr. S. Anandan, Department of Chemistry, National Institute of Technology, Tiruchirappalli, India .

Dr. S. Anandan, Professor of Physical Chemistry hailing from Tamil Nadu, India, is leading the research group “**Nanomaterials and Solar Energy Conversion Lab**”. His research interests include hybrid semiconductor nanomaterials and their applications in **Dye-sensitized solar cells, supercapacitors, perovskite solar cells, photocatalysis, electrocatalysis, fuel cells, and biosensors**. He is the author of **400+ research articles, 30+ book chapters, two international patents** and his h-index is **57**. He is serving as an **editorial board member** in Ultrasonics Sonochemistry - Elsevier Journal. **28+** Research Scholars and **57+** M. Sc. Students have completed their degrees under his guidance. In addition, **five Ph.D.** and **two M. Sc.** students are pursuing research under his guidance.



### Course Faculty:

Dr. Jegadesan Subbiah, School of Chemistry, The University of Melbourne, Australia.

Dr. Jegadesan Subbiah received his Ph.D. degree in Material Chemistry from the **National University of Singapore**, Singapore, in 2007. After PhD, he did his Postdoctoral research at the Department of Materials Science and Engineering, **University of Florida**, USA, for three years. Since Apr 2011, he has been working as a Senior Research Fellow/Senior Lecturer at Bio21 Institute, School of Chemistry, The University of Melbourne, and he is also a **visiting Scientist** at CSIRO, Clayton campus, Melbourne, Australia. His research interests include **organic and perovskite solar cells, device physics of organic photovoltaics, nanomaterials, renewable energy conversion and storage, and interface engineering of organic semiconductors and electrodes**. Dr. Subbiah has made a significant impact on his research with **105+** peer-reviewed journal publications, which have received **8200+** citations in high-impact journals, and his h-index is **41**. In addition, he has published **one** book chapter and has **four** patents. He also serves as the **editorial board member** for various scientific journals, such as the International Journal of Photoenergy, the Interdisciplinary Journal of Chemistry, and the Solid and Open Journal of Organic Polymer Materials.



### Accommodation:

Hostel (Per head)	₹ 150 + 18 % GST
Guest House (Single Occupancy)	₹ 1200 + 18 % GST
Guest House (Double Occupancy)	₹ 2000 + 18 % GST

### For any queries, Please contact:

1. Mr Mohamed Siddiq (+91 8610 80 3908) ([mohamed.siddiq3188@gmail.com](mailto:mohamed.siddiq3188@gmail.com))
2. Mr Adrian Ebenezzer Paul (+91 7339 22 3788) ([adrianebenazerpaul@gmail.com](mailto:adrianebenazerpaul@gmail.com))