

About Department of Physics

Founded in 1978, the Department of Physics at Anna University is a dynamic center for both teaching and research, with a strong emphasis on fundamental and applied physics within the realm of materials. Our dedication to academic excellence is reflected in the diverse range of courses we offer, catering to various educational and research pursuits. The department's curriculum includes M.Sc. (Materials Science), and M.Tech. (Laser & Electro-Optical Engineering), M.Phil. (Physics) & Ph.D. (Physics)

About C-mAIn

The Centre of Materials Informatics (C-mAIn) is one of the 16 Centres of Excellence established recently by Anna University to promote research in emerging technology. C-mAIn aims to pave the way for transdisciplinary research in materials for energy, environment, and healthcare applications. We work towards inventing new materials for emerging technologies using Artificial Intelligence (AI). C-mAIn is a confluence of faculties and researchers from the Department of Physics, Department of Chemistry, Department of Computer Science, Institute of Energy Studies, Department of Mechanical Engineering and Department of Civil Engineering.

CHEIF PATRON

Prof. R. Velraj

Vice-Chancellor, Anna University.

PATRONS

Prof. J. Prakash

Registrar (i/c) , Anna University.

Dr. L. Suganthi

Dean
College of Engineering Guindy
Anna University

CONVENER

Dr. G. Kalpana

Prof & Head
Department of Physics
Anna University

COURSE CO-ORDINATOR

Dr. R. Vidya

Director (i/c)
Centre For Materials Informatics (C-mAIn)
Anna University

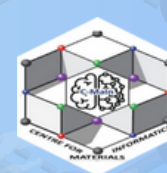
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Value-added course on Insights into the Materials for Renewable Energy Technologies

COURSE INSTRUCTORS



Prof. Helmer Fjellvåg

Professor

Centre For Material Science & Nanotechnology
(SMN)

University of Oslo,
Norway

Prof. Anja Olafsen Sjøstad

Professor

SMN

University of Oslo,
Norway



08 - 12 JAN 2024



HALL OF LUMINANCE,
SIR C.V RAMAN SCIENCE BLOCK
CEG, ANNA UNIVERSITY.

Course Offered by

**Department of Physics &
Centre for Materials Informatics (C-mAIn)
Anna University**

OBJECTIVES

This course addresses the need for novel functional materials to drive the widespread adoption of renewable energy technologies. Covering organic and inorganic materials, it explores functionalities crucial for energy generation, storage, catalysis, and relevant characteristics of materials. Students can gain contemporary insights into the properties, applications, and recent developments of advanced functional materials applied in renewable energy technologies. The course focuses on synthesis, characterization, and fabrication techniques of materials thus enlightening students on practical applications for energy generation, storage, and transmission.

DESCRIPTION

This course offers a comprehensive exploration of functional inorganic materials and their pivotal role in renewable energy generation and storage devices. Emphasizing chemical processing methods, the curriculum delves into the design and synthesis of advanced functional materials, with a focus on understanding reaction mechanisms. The course traces the sequence from molecular precursors to nanoparticles and final functional solids, highlighting how the manufacturing process influences crystallographic structure, microstructure, and functional properties. Key topics span inorganic solids, synthesis methods, thin films, nanostructures, and various characterization techniques, encompassing X-ray diffraction, electron microscopy, spectroscopy, and surface characterization methods.

ABOUT INSTRUCTORS

Helmer Fjellvåg is a Professor at the Department of Chemistry & SMN, University of Oslo, Norway. He has more than 45 years of teaching and research experience. His research is centered on the synthesis and characterization of the structure and magnetic properties of various materials, especially for energy-related applications. He has authored 600 scientific articles and several book chapters covering a wide range of topics in materials chemistry. He has collaborated with many researchers worldwide and completed several national and international research projects.

Anja Olafsen Sjøstad is a Professor at the Department of Chemistry & SMN, University of Oslo, Norway. She has more than 25 years of experience in industry and academia. Her research focuses on bimetallic nanoparticles, band gap engineering of materials, and catchment materials. Her recent work explores topics like ammonia oxidation, band gap Engineering, and magnetic interactions. Her research contributes significantly to materials chemistry with implications for catalysis and energy storage.

MAIN TOPICS TO BE COVERED:

1. Nanomaterials for energy technology/storage
2. Synthesis of inorganic materials; bulk, films, nanoparticles, surfaces
3. Materials studied by in-situ and operando methods
4. Anisotropic nanomaterials; layered materials, tubes, and rods
5. Size-dependent properties
6. Structure-property relations; structure determination
7. Chemical bonding - compounds, molecules, complexes
8. Design of catalysts and supports

LEARNING OUTCOME OF THE COURSE:

1. Grasp the principles of functional materials.
2. Identify and choose appropriate fabrication and characterization techniques for specific nanomaterials, functional materials, and devices.
3. Apply acquired knowledge to practical use in various applications like optoelectronics, photovoltaics, and energy.
4. Correlate distinct property combinations in advanced materials.
5. Comprehend recent advancements in the chosen advanced functional materials that are used in renewable energy technologies.

COURSE DETAILS

Who can attend:

- M.Sc (Materials Science & Applied Chemistry),
- M.E (Energy & Solar),
- M.Tech (Laser and Electro-optics Engg & Nanoscience and Technology)
- 3rd & 4th year B.E. (Materials Science & Chemical Engineering) from AU
- M.Sc. (Physics, Chemistry, Materials Science) from other colleges

Course Duration: 30 Hours

Course Credit: 2

Course grades will be based on assessment test marks, Credits will be included in transcripts for AU students.

A certificate will be provided upon successful completion of the course

Course Period: 08.01.2024 – 12.01.2024

REGISTRATION FEE

Rs. 1200/- (inclusive of GST)

To be paid through

Demand Draft (DD) drawn in favor of "**The Director, CSRC**" payable at Chennai.
or

A/c Name : CSRC Project A/C

A/c No : 30061247489

IFSC Code : SBIN0006463