

JISIASR Kolkata-An Institute with a Difference...

JIS Institute of Advanced Studies and Research (JISIASR) Kolkata, JIS University offers

**Post Graduate Program (M.Sc.)
in
Polymer Science and
Technology (PST)
(2020-2022)**



through
**Centre for Interdisciplinary
Sciences (CIS)
JISIASR Kolkata**

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JISIASR Kolkata

JIS Group, aligning with the dynamic evolution of professional education methodology, has started an academic and industry based research institute – **JIS Institute of Advanced Studies and Research (JISIASR) Kolkata** (affiliated to JIS University) with the goal of being one of the important and value based post graduate and research institutes of the country.

Centre for Interdisciplinary Sciences (CIS)

Objective of CIS is to emerge as a research ecosystem of global reach in the design and development of advanced materials adhering to the norms of industries. In view of post pandemic ages, the centre is going to focus in some timely training and education on potential applications in advanced materials science, energy materials, and sensor technology & IoT. One of the major future applications of advanced materials would be based on polymers in healthcare applications, protective equipments, sensors, 3D printed implant design and fabrications, protective antimicrobial coatings using nano materials with the concept of integration of interdisciplinary technologies resulting in hi-tech products.

We have collaboration with several academics (IITs, MGU) and industries through MoUs that may help us to access the experimental facilities of our collaborative institutes.

Ongoing Research at CIS

Presently faculties and research scholars at CIS working on fabrication and application of polymeric and sensor materials, biomaterials, devices, and nano composites as a part of translational research for JISIASR Kolkata. Around 1.5 crore of research funding has been awarded to CIS from different governmental and industrial funding agencies. JISIASR Kolkata is recognised by Scientific and Industrial Organisations (SIROs), and Dept. Of Scientific and Industrial Research (DSIR), Govt. of India. Therefore several government funds (DST, DBT, Inspire etc.) for advanced research.

M.Sc. Program Highlights

- Candidates with good academic profile admitted to this program will be considered for teaching assistantship with **monthly stipend/scholarship**
- Ensuring all students will receive extensive hands-on training to improve individual skills, to grab the future opportunity
- Research/industrial training in leading National and International institutes
- Unique curriculum designed for needbased academic and industrial activities
- Cutting edge research with in-house laboratory facilities
- Excellent placement support to facilitate a career in various institutions such as universities, colleges, schools, research and development centers of private limited and public companies etc

Learn...

Innovate...

Grow...

Core Courses

- Introduction to Polymer Science and Engineering
- Basic Polymer Chemistry
- Basic Statistics
- Basic Polymer Physics
- Rheology and Mechanical Properties of Polymer
- Basic Characterization Techniques of Polymers
- Fabrication Techniques
- Biopolymers
- Polymer Processing and Recycling
- Industrial Polymers
- Rubber Chemistry
- Polymer Composites
- Molecular Spectroscopy
- Coating Technology
- Biomaterials and 3D printing

Elective Courses

- Pigments & Additives for Polymers
- Industrial Paints
- Coating Chemistry
- Design & Fabrication of Molds
- Technology of Elastomers
- Technology of Thermoplastic
- Packaging & Decoration of plastics
- Basic Textile Technology
- Resin Chemistry
- Industrial Management

Laboratories

- Lab facilities for analysis, Characterization of raw materials & Synthesis of resins, rubber, fibers, and polymers
- Compounding & processing lab
- Coating Chemistry Laboratory
- 3D Printing Laboratory
- Polymer Testing Practical
- Advanced Sensor Fabrication Technique

Eligibility Criteria for Admission

Candidates from universities in West Bengal with B.Sc. (Hons.) in Chemistry/Physics/Life Sciences with 50% marks are eligible to apply. Candidates without Hons. from WB/ from other states should have a minimum of 50% marks in relevant discipline along with 45% marks in aggregate.

Admission Procedure

Candidates are requested to apply through online application portal. Application forms are available on our official website (www.jisiasr.org). Candidates need to appear for an entrance test and/or interview conducted by JISIASR Kolkata (JIS University). Details of the entrance test will be provided to the candidates in due course.

Scopes & Placements

This course is designed to meet the growing demands from immediate academic and industrial world.

Candidates pass-out from this course will have a great opportunity to join advanced in-house PhD program offered by JISIASR Kolkata with scholarship or to any other leading national/international institutes for higher study/research.

End user industries in Polymers Market in India are: food packaging, foam packaging, electrical & electronics, automotive & transportation, consumer goods and others. Few key players in this sector are: Indian Oil Corporation Ltd., Reliance Industries Ltd., Haldia petrochemicals Ltd., Gail, GE, SABIC, BASF, LG Polymers, Tata Chemicals, and others. There is a possible scope to be absorbed to the following industries/sectors after completion of the PG Program:

- ✓ Plastic industry
- ✓ Protective/Technical textile industry
- ✓ Tyre industry
- ✓ Rubber based industry
- ✓ Automotive part sector
- ✓ Paint/coating industry
- ✓ Analytical laboratories
- ✓ Medical implant manufacturing
- ✓ Composite industry
- ✓ 3D printing Start-ups/ company
- ✓ Construction industry
- ✓ Drug design/manufacturing company

Endless Opportunities to Grow

This could be probably the appropriate time for the young students to choose their career in polymer science and technology in India. As envisioned by the Honorable Prime Minister of India, we, the Indians, are now determined to become an AtmaNirbhar or self-reliant nation in all possible aspects in near future. This indicates the huge upcoming opportunities in local manufacturing, start-up ecosystem, innovative design and fabrication of materials in general, and polymer in particular.

Polymer Science is an interdisciplinary area that establishes a coherent bonding between chemists, physicists, materials scientists, and chemical, electronics, and polymer engineers. Recently biology enters as an important support system in development of polymers for advanced applications in health and biomedical sciences.

Encouraging Facts

- The growth of Polymer consumption in India is projected to reach to 20 MMT by 2020
- Observed growth rate (CARG) in capacity of machinery installed in polymer industries is 11.1% from 2016-17 to 2019-20

Initiatives through Schemes (Make in India, Digital India)

- Several flagship programs by Govt. of India launched
- The target is to make the **Net Import ZERO** for the following goods:

Goods	% of present import
Mobile Phones	37
Smart TVs	8
Notebooks	6
Digital Cameras	4
Invertors & UPS	3
USB	2
STB's	2
LCD Monitors	2

This will require a huge employment generation for skilled man-powers in polymer science and technology.

Driving Factors

Healthcare, sustainability, and circular economy are to be driving factors to future science & technologies and innovations to ensure energy security, access to clean water, protection of the environment, and affordable healthcare. Polymer materials are going to play a major role in this circumstances. Although polymers have been ubiquitous as it can be found in almost each material used in our daily life, the specific demand would exist in the following areas.

Future Demand

- ❖ **Healthcare:** Post-pandemic era will belong to exceptional growth in healthcare service that will require huge innovation in medical polymer materials and their fabrication techniques. Artificial organs, prosthetics, spectacles through 3D printing, medical textiles (PPEs) for resisting microbial contamination, medical packaging, sensors, disposable plastics are to going to be the need of the hour.
- ❖ **Paints and Coating:** Innovative solution to disinfect solid surfaces, textiles, frequent sanitization in small and large scale to ensure bioprotecting would accelerate the demand for antiviral and antimicrobial paints and coating formulations.
- ❖ **Packaging:** High growth of retail sector has set the background for immediate demand of polymer materials in packaging such as green packaging, single use plastic, textiles, etc.
- ❖ **Infrastructure:** Building and construction, automotive, and electronics sections need innovative polymers for corrosion resistant and durability attributes.
- ❖ **Agriculture:** Polymers may bridge the 2nd generation green revolution through greenhouse film, low tunnelling materials, mulch films.

For Further Enquiry

Visit: [Admission 2020 section in our website](#)

(www.jisiasr.org)

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