



**University Of Calcutta**  
**Department of Chemical Technology**  
**Admission to Ph.D. (Tech) Programme (RET 2022) in *Applied Chemistry,***  
***Ceramic Engineering, Oil Technology and Petrochem. & Petroleum Refinery Engg***

**Total Number of Seats:**

Applied Chemistry	– 03
Ceramic Engineering	– 02
Oil Technology	– 01
Petrochem. & Petroleum Refinery Engg.	– 02

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**Reservation in admission shall strictly abide by the West Bengal State Higher Educational Institutions (Reservation in Admission) Rules, 2013.**

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**Eligibility :** The eligibility of the candidate will be as per UGC rules.

- (A) Candidates having degree in Bachelor of Technology or Master of Science (without NET/SET/SLET/GATE) securing 55% marks (selection through Entrance Test & Interview);
- (B) Candidates having degree in Master of Technology or Equivalent or Master of Science (with NET/SET/SLET/GATE) securing 55% marks (**Selection through Interview only**).

**Entrance Test:**

- The Ph.D. Entrance test will be of 50 marks (duration 1 hr.) consisting of both Multiple Choice Questions (MCQ) and short questions.
- The [Syllabus](#) for the Entrance Test and subsequent list of the successful candidates will be available in the Departmental Notice Board (near the room of the HOD, Ground floor, Applied Chemistry Building).
- The successful candidates will have to appear for an interview for final selection.
- Declaration of names of selected candidates to be notified later (Subject to approval by the Honorable Vice Chancellor)

**Important Dates:**

- Last Date for Submission of Application Form: 28<sup>th</sup> September, 2022
- Date of Entrance Test : 18<sup>th</sup> October, 2022 (12:00 Noon)
- Publication of List of successful Candidates : Display in the Notice Board
- Date of Interview : 20<sup>th</sup> October, 2022 (2 p.m. onwards)

**Venue:**

- For Entrance Test: Departmental Seminar Room (2<sup>nd</sup> floor, Applied Chemistry Building)
- For Interview : Room of the HOD, Department of Chemical Technology  
(Ground Floor, Applied Chemistry Building)

All Candidates are requested to download the Application Form from the University website ([www.caluniv.ac.in](http://www.caluniv.ac.in)) and submit the filled in Application Form, Attested copy of relevant mark sheets, along with the receipt of deposition of Application Fee of Rs. 100/-, paid through SBI Collect, within the due date and send to the Head, Department of Chemical Technology, University of Calcutta, 92 Acharya Prafulla Chandra Road, Kolkata–700009 (Email: [hdctcu@gmail.com](mailto:hdctcu@gmail.com)).

No TA/DA shall be paid to the candidate for appearing the Entrance Test or called for the Interview.



**UNIVERSITY OF CALCUTTA**  
**Department of Chemical Technology**

Application Form for Admission of the Ph.D. (Tech.) Programme 2022 in

Applied Chemistry

Ceramic Engineering

Oil Technology

Petrochem. & Petroleum Refinery Engg.


Name (in BLOCK LETTERS):

Date of Birth :

Father's Name :

Sex : Male/Female/Third Gender

Marital Status :

Whether SC/ST/OBC/  
Physically Challenged :

Nationality :

Address for Communication :

Phone No. :

Mob:

E-mail ID:

Academic Qualifications (Bachelor Degree onwards):

Name of the Examination	Year	University	Subjects taken	Div./Class	% of Marks

Whether qualified in NET/GATE/equivalent examination:

Signature of the applicant with date:

Self attested copies of documents are to be attached.

\*Candidates are requested to deposit application fee of Rs.100/- through **State Bank Collect.**

\*\* Original documents may be asked for as and when required by the appropriate authority.

## Procedure of Payment through State Bank Collect

### MODE OF PAYMENT:

#### Application Fee

Application Fee: **Rs.100/-**

Two payment methods are available i.e. online payment through Internet Banking /ATM cum Debit Card/Credit Card or by cash deposition at any State Bank Branch.

#### A. Online Payment :

##### The instructions for the On-Line Payment of Application Fees

The Application Fees can be paid through **State Bank Collect** online Banking from anywhere. Facility can be operated by candidates also through their online banking facility. However, they should enter their ward's details correctly. The steps stated below shall be strictly followed

This facility is available to students and parents having "SBI internet banking facility or **SBI ATM-cum-Debit Card**". Account Online Transaction facility".

In addition to **this**, candidates having "**Other Bank Debit Cards or Credit Cards**" can also log on to [www.onlinesbi.com](http://www.onlinesbi.com) and make their Payments of Fees through this portal following the instructions given below. Bank Commission is Rs.10/- to Rs.15/- as applicable extra to be borne by the candidate.

##### Instructions for Payment of Fees through State Bank Collect from SBI Portal (Steps 1 to 27)

1. Go to [www.onlinesbi.com](http://www.onlinesbi.com)
2. Select State Bank Collect on Top Horizontal Bar.
3. Read and Tick Mark ( ✓ check box) on Accept Terms & Conditions.
4. Click on Proceed.
5. Select State: West Bengal (from drop down menu).
6. Select *Type*: Educational Institutions (from drop down menu).
7. Click on GO.
8. Select Educational Institution: Calcutta University PG ONLINE SYSTEM
9. Select (Appropriate Option): Misc Fees
10. Category: Other
11. Remarks: **Fees for RET 2022 in Chemical Technology**
12. Click on Submit.
13. Please verify the entries carefully for its correctness. Once transaction is completed cannot be reverted.
14. Click on Confirm.
15. You will see State Bank *Multiple Options Payment System* (MoPS)
16. You may choose Net Banking (SBI only) or Card payments.
17. In Card Payments, you have three options: 1. SBI ATM-cum-Debit Card, 2. Other Bank Debit Cards and 3. Credit Cards (Check the Bank Charges, appearing against all these options)
18. Note that Bank Charges are minimum for SBI Net Banking and SBI ATM-cum-Debit Card.

## **Syllabi for Entrance Test in Ph.D. (Tech.) Programme in**

### **Ceramic Engineering**

- Physics and Chemistry of Clay Minerals
- Refractories: Definition, Classification, Important Properties & Applications.
- Introduction to Glass & Vitreous Coatings.
- Introduction to Hydraulic Binders & Concretes.
- Introduction to Fine Ceramics, Electronic Ceramics.
- Analysis of important Ceramic Raw Materials and Products.
- Physical Testing of Ceramic Raw Materials & Products.

### **Oil Technology**

- Chemistry & Technology of Fats & Oils-Sources, Chemistry, Processing, Physical and Chemical Properties.
- Nutritional Aspects of Fats & Oils.
- Edible and Non-Edible applications of Fats & Oils.
- Lipid Derivatives/Fat based Oleochemicals.
- Chromatographic Analysis of Fats, Oils and Allied Products.
- Basic Operational Principles of UV, IR, GC, HPLC, GC-MS, LC-MS, Short Path Distillation etc.
- Lipid Biotechnology.
- Fat-based Surfactants.
- Basic Chemistry and Technology of Surface Coating.
- Perfumery Chemistry.

### **Petrochemicals and Petroleum Refinery Engineering**

- Crude Oil & Petroleum Product Analysis-Qualitative & Quantitative
- Common Refinery Operations-Desalting, Distillation, Stripping, Absorption, Solvent Extraction, Dewaxing, Desulphurizing, Reforming and Cracking.
- Petrochemical Feedstock: Preparations & Olefins Production
- Computer Operations-MS Windows XP Packages, Win word, Excel, Power Point.
- Optimization & Correlation Methods.
- Programming Languages, any one of –C/C++/Fortran 90/VB/VC++ & Handling Compilers of any of these.

### **Pharmaceutical & Fine Chemical Technology**

- Principles of Analysis of Drugs & Fine Chemicals in Pharmaceutical & Cosmetic Formulations by Chemical, Physico-Chemical, Biological and Micro-Biological Methods. Biological Standardization. Toxicity Studies of Drugs. Statistical Methods of Evaluation.
- Rational Drug Design. Study of Synthetic Drug like Prostaglandins, Steroids and anti-HIV, biologically active Peptides, newer chemotherapeutic agents, chemically targeted drugs etc.
- Principles & Engineering, Fermentation of Dextran, Lactic Acid, Antibiotics of importance. Manufacture of Immunological Products like Bacterial and Viral Vaccines, Human Immunoglobulin, Monoclonal Antibodies, Tissue Culture Products and their utilization. Development of Genetic-Engineering Products. Bioreactors & Biosensors.
- Pre-formulation, manufacturing techniques of Novel Drug Delivery Devices. Unit Operations involved in formulations. Stability Studies, Product Development, GMP/GLP. Pharmacokinetics, Pharmacodynamic, Drug interactions.
- Optimization of Pharmaceutical and Bioprocesses. Programming languages-Fortran, C, C++ and Basic.

### **Chemical Technology (Applied Chemistry)**

- Structure, Features and applications of Natural Products like Prostaglandins, Steroids and Peptide Hormones, Essential Oils, Lipids, Petroleum Fractions, Resins, Terpenoids and Carotinoids, Silicates and Zeolites.
- Inorganic Analysis of Alloys, Minerals, Semiconductors and Glass.
- Organometallics and Applications on Catalysis; Metaloenzymes, Autocatalysis.
- Supramolecular Chemistry-Self Assembly, Reactivity and Catalysis.
- Pericyclic Reactions and Retro-Synthesis Analysis of Fine Chemicals.
- Enzymology, Biomembranes and Transport Processes.
- Micro and Macro Emulsions, Micellization.
- Polymerization; Principles in Polymer Characterization, applications of Polymers in Separation Processes.
- Fundamentals of Fluid Flow; Heat Transfer; Mass Transfer; Size Reduction and Separation Processes.
- Chemistry and Application Of Common Industrial Products like Ceramics, Petrochemicals, Oils & Paints, Pharmaceutical & Fine Chemicals.
- Waste Management, Chemical and Biological Waste, Water Quality.
- Operating Principles and Applications including Industrial Applications of IR, XRD, SEM, TEM, GC, HPLC, MS, Thermal Analysis like DTA, TGA, DSC, Electrophoresis, Fluoremetry, Elisa, Tracer Techniques, Raman Spectra and its applications in mineralogy and Bio-molecules.