

S K Somaiya College
Admission Manual

Ph.D. Programme
Chemistry

July 2021

Visit for Further Details: <https://www.somaiya.edu/en/phd/>

About Somaiya Vidyavihar University

On 26th August 2019, Somaiya Vidyavihar University has become a reality

A new milestone in a glorious ongoing journey established in 2019, Somaiya Vidyavihar University, Mumbai recognised by the University Grants Commission (UGC). Somaiya Vidyavihar, with over six decades of rich experience in building and managing educational institutes of great repute, is the sponsoring body. With over six decades of rich experience Somaiya Vidyavihar has become a self-finance Private University. Somaiya Vidyavihar University is the first private university in Mumbai vide the Maharashtra Self- Financed Universities (Establishment and Regulation) Act 2013. With this status, we now have the academic, administrative, and financial freedom, to achieve the dreams as imagined by our founders. We have a dream to build and support a world class institution, one that is proudly Indian, and excels in education, research and service. Somaiya Vidyavihar University will be a place where knowledge is preserved, disseminated, and new knowledge is created. It will be global in the reach of its ideas and universal in its service. Operational from 26th August 2019, Somaiya Vidyavihar University is a place where you can explore new possibilities, pursue your passion and above all, find yourself.

Our History

An all-round education must integrate Indian culture, values & morality into the curriculum.

In just five decades it has grown into a large educational complex with 34 institutions catering to diverse fields of education such as Humanities, Engineering, Education, Medicine, Management, Pure Sciences and Mass Communication, with more than 39000+ Candidates and 3000+ Faculties and staff on a throbbing 65 acre campus.

The Somaiya Vidyavihar Complex was founded in 1959 by late Shri K.J. Somaiya (1902-1999). Endowed with a sharp business acumen, a balanced perspective and a social bent of mind, Karamshibhai set up the Somaiya Trust in 1953 for furthering his dream of shaping young minds through quality education. For this purpose, he bought a large area of land at Ghatkopar, then considered to be distant, meagrely populated.

Our Vision

Our Founder, Padmabhushan Shri K. J. Somaiya founded Somaiya Vidyavihar on the 9th of September 1959. He later founded the Girivanvasi Pragati Mandal, The K J Somaiya Medical Trust, Girivanvasi Education Trust and sister institutions to make great citizens of India and the World. In the words of Swami Vivekananda, "We want that education by which character is formed, strength of mind is increased, and the intellect expanded, and by which one can stand on one's own feet." We have now grown into a multi-disciplinary and multi-campus education institution with over 1500 faculty, and 38, 000 candidates.

The Somaiya Vidyavihar University admitted 3000+ candidates in 100+ UG/PG/PhD/PG Diploma/Diploma/Certificate programmes in the very first year of establishment.

About Research Center

Research Centre in Chemistry presently nested under the Department of Polymer Science. Our centre's current focuses are Computational chemistry and Electron induced chemistry.

Computational Chemistry

During the past few decades, the world has witnessed myriads of novel materials that have been (and are being) discovered or synthesized. We have the experience and expertise that we could inculcate over the past years, become indispensably relevant for investigation on materials. This experience has enabled us to gain, develop and further hone our expertise in some fascinating and diversified domains computational and quantum chemical simulations in catalysis, reactions at interfaces, hydrogen-storage materials, hydrogen bonded clusters, while enriching our knowledge-base in basic science.

The relevance is that a quantum chemical investigation simulates at the molecular level a material and brings out its finer nuances in characteristics and its reactivity. A computer 'experiment' (an 'in silico' simulation) can therefore leads us to pre-emptive determination of properties and descriptors and gauges its role by predicting its properties, prior to actually doing an experiment in the laboratory. This would provide enormous impetus for characterizing different materials in silico enabling one to glean out pointers through which one could converge on what experiments actually, i.e. in vitro or in situ could be carried out. The computer simulations therefore play a dual role: give proper directions and eliminate, pre-emptively, irrelevant materials. Thus, it is no wonder that the field of 'Computational and Quantum Chemistry' has now become extremely crucial in handling the challenges of modern times, both in academia and in industry.

A brief outline of the research-topics that our center pursues are given below.

Computational and Quantum Chemical Modeling

1. Novel solar photocatalysts for hydrogen generation

Solar photocatalysts have attracted the attention of the researchers for more than past decades or so as they provide the economic and easy route to generate H₂ energy by water and H₂S splitting.

Objectives

The proposed research project is aimed at development, physicochemical characterization followed by the testing and validation of the better solar photocatalyst for hydrogen generation employing computational simulations and experimental approach (collaboration with Centre for Materials and Electronics Technology, Pune, India).

2. Molecular Clusters, Organic reaction mechanism and catalysis

Objectives

Ab initio quantum chemical and density functional theory (DFT) framework is aimed at providing the guidelines for efficient and accurate modeling of a) molecular clusters, b) heterogeneous catalysts, as well as c) various organic reactions as well as complement the experiments.

Our center is having ongoing collaborations with Professor Libero J. Bartolotti (East Carolina University, Greenville, NC, USA) and Professor Shridhar R. Gadre (S. P. Pune University, Pune, India).

Electron Induced Chemistry

Electron induced chemistry plays a major role in a variety of natural phenomena starting from interstellar medium and planetary atmospheres to radiation biology due to their ubiquitous presence. They also play a primary role in all of plasma chemistry leading to a wide variety of practical applications, the high profile industrial application being in nanolithography. The end result of all high energy radiation in matter is the production of large number of low energy (< 20 eV) electrons with their increased chemical activity of selectively binding to molecules forming excited states of molecular negative ions which decay producing very reactive species like radicals and negative ions (dissociation channel called Dissociative Electron Attachment) or

vibronically excited molecules (electron detachment channel). While the realization that low energy electrons are efficient agents of chemical transformation is relatively recent, that these electrons can be used as a tool to control chemical reactions at the single molecule level, in gas phase, and in condensed phase based on their attachment properties to molecules forming negative ion complexes is more recent. This evolving area of chemical control using electrons has become more fascinating after it was proposed recently by us that a low energy electron can be used as a catalyst for selective multi-bond breaking reactions. Since then we have been pursuing this activity and have succeeded in demonstrating catalytic action of electrons. This is a developing area of research and very little is being done in India. Our aim is to develop and establish a group actively pursuing the study of electron induced chemical reactions relevant to natural phenomena (e.g. chemistry on the interstellar grains) as well as practical applications (e.g. radiation biology, pollution control) and their possible control.

Currently we are pursuing computational chemistry calculations and electron impact experiments in the following area:

1. Electron induced chemical processes

We study electron attachments states or negative ion resonance states (NIRs) and reaction pathways theoretically using *ab initio* quantum chemical methods.

We also do studies of free electron induced chemical syntheses by doing electron collision experiments on different types of simple & complex molecules and also on mixtures of compounds. This also includes study of different classical reaction mechanisms; e.g. eliminations, rearrangements etc. by free electron to understand the difference.

This project is in Collaboration with Bhabha Atomic Research Centre, Mumbai.

2. Low energy electron induced light repair of DNA

In this work we aim to concentrate on the studies mainly on biological molecules like DNA bases and their dimers, amino acids etc. The main interest in this is the DNA

damage and repair by low energy free electrons (LEFE). DNA bases pyrimidines can get damaged by UV photons and form cyclobutane dimers and these are the cause of skin cancers in humans. Some organisms are capable of repairing these damaged dimer sites using another UV photon with the help of electron transfer. We will study this pyrimidine damage and repair by free electrons.

This Project is also in Collaboration with Bhabha Atomic Research Centre (BARC), Mumbai.

3. Astrochemistry

The objective here is the study of chemical synthesis in interstellar medium (ISM) by simulating the environment of astrochemical conditions. The temperature in ISM environment is near to 10-20 K. We can achieve this temperature through a cold head. It is proposed that the syntheses in the ISM environment mostly happened in dust grains at these lower temperatures. It has been noted that ubiquitous low energy secondary electrons in the ISM environment can also contribute to these syntheses. With our cold condensed phase electron collision apparatus, we will be able to simulate this environment and deposit the sample for electron irradiation in that environment. In this set of study, we concentrate on astrochemically important molecules such as glycine, polyaromatic hydrocarbons (anthracene), glycolaldehyde etc.

This project is in collaboration with Tata Institute of Fundamental Research, Mumbai

Development of computational simulation laboratory

Investigations on all the above projects require a high-performance computational facility. We are in a process to develop the high performance computational (HPC) facilities in the Chemistry Research centre.

Ph.D. Admission Eligibility for Somaiya Vidyavihar University (SVU): Minimum Qualifications for Admission

Subject to the conditions stipulated in the Regulations, the following candidate are eligible to seek admission to the Ph.D. Programme

i.	Master's degree or a professional degree declared equivalent to the Master's degree by the corresponding statutory regulatory body, with at least 55% marks in aggregate or its equivalent as per UGC regulations.
ii.	A person whose Master's dissertation has been evaluated and the viva-voce is pending may be admitted to the Ph.D. Programme but subject to completion of Master's degree before provisional admission to SVU Ph.D. Programmes.
iii.	Candidates possessing a Degree considered equivalent to Master's Degree of an Indian Institution, from a Foreign Educational Institution accredited by an Assessment and Accreditation Agency which is approved, recognized or authorized by an authority, established or incorporated under a law in its home country or any other statutory authority in that country for the purpose of assessing, accrediting or assuring quality and standards of educational institutions, shall be eligible for admission to Ph.D. Programme.
iv.	Candidate not having Master's degree but having research / work / professional experience or possessing post graduate diploma may appear for Ph.D. Entrance Examination of SVU subject to such candidates need to apply separately to SVU for obtaining equivalence for Master's degree. The SVU will have final rights reserved to give such equivalence as per the regulations. Such candidates must possess undergraduate degree with at least 55% marks in aggregate or its equivalent as per UGC regulations. The relaxation will be as per UGC norms from time to time.
v.	MUST have qualified score of Ph.D. Entrance Examination of SVU – mandatory eligibility criteria for all candidates.
vi.	Candidates exempted from appearing for Ph.D. Entrance Examination of SVU MUST fill the application form as per the schedule displayed on website. The exempted candidates need not pay the application processing fee.
vii.	A No Objection Certificate (NOC) in prescribed format from the employer in case of those who are applying to Ph.D. Programme as a sponsored candidate.

Eligibility at UG/PG Degree	
Branch of study at UG	Chemistry Polymer Chemistry Biochemistry Environmental Chemistry
Branch of study at PG	Chemistry Physical Chemistry Organic Chemistry Inorganic Chemistry Analytical Chemistry Polymer Chemistry Applied Chemistry Chemical Technology Hydrochemistry Biochemistry Environmental Chemistry

Exemption Criteria for SVU Ph.D. Entrance Examination

Candidates who qualified in UGC - CSIR -NET-JRF/ ICMR-JRF / DBT-JRF (BET)/ INSPIRE/ Prime Minister's Fellowships and those qualified in any of the UGC recognized national or state level eligibility tests with a valid fellowship in the Chemical Sciences and related field.

However, the candidates who fulfill the above criteria **MUST** fill the application form as per the schedule displayed on the website.

Pattern and syllabus of SVU Ph.D. Entrance Examination

Subject of Entrance Examination: Chemistry

The SVU Ph.D. Entrance examination will be proctored/supervised close book examination

Paper-1 General Aptitude Test – MCQs Online test of 30 marks with 30 questions - duration of the test 30 min.- no negative marking and options

- a) Logical Reasoning
- b) Numerical Ability
- c) Reasoning and Language Aptitude

Paper - 2: Subject Specific Test – Online of 70 marks - duration 1 and half hours

a) Multiple Choice Questions – Maximum marks – 10 - MCQs online or offline test of 10 marks with 10 questions - **no negative marking and option**

b) **Theoretical / Descriptive Questions – Maximum marks 60 – online or offline descriptive type six questions each of 15 marks - any four to be solved**

Syllabus for Entrance Examination

CSIR – NET/JRF syllabus 2021 for Chemical Sciences

Documents Required

1. UG Degree or equivalent Mark List
2. UG Degree certificate
3. PG Degree or equivalent Mark List
4. PG Degree or equivalent certificate
5. AADHAR card
6. Degree equivalence / eligibility certificate – wherever is applicable
7. Migration certificate
8. Two colour passport size Photograph
9. If appearing the PG degree examination – bonafide certificate
10. If employed, then No Objection from the employer – at the time of provisional admission

Sr. No.	Steps adapted for Ph.D. Programme
1.	Advertisement in the newspaper
2.	Acceptance of the applications for Ph.D. entrance examination along with applications processing fee
3.	Execution of Ph.D. entrance examination for all PhD programmes
4.	Results of Ph.D. entrance examination
5.	Selection process - Display of list of eligible shortlisted candidates for interview
6.	Selection process – Interviews of shortlisted candidates
7.	Display of shortlisted candidates for provisional admission
8.	Provisional admission and payment of fees in accounts/admin office of the colleges.
9.	Orientation and beginning of the yearlong two semester course work
10.	Allotment of the guide at individual college level / department (within the first six months of provisional admission)
11.	In the first year, first semester is course work, which includes teaching learning, continuous evaluation and ESE examination (Comprehensive examination). The second semester will have dedicated research activities, lab rotation and research proposal drafting & presentation and its evaluation.
12.	Research proposal presentation (Qualifying examination)

Somaiya Vidyavihar University

13.	KT examination for the semester I and II for unsuccessful candidates or for grade improvement
14.	Issue of mark sheets for course work of semester I and II
15.	Topic approval of the thesis work (after Qualifying course work examination)
16.	Registration for Ph. D programme
17.	Appointment of Examiners and chairman from Research Committee
18.	Annual Progress Seminars (APS) every June/July and Intermediate Progress Seminar (IPS) every January/February of the academic year
19.	Approval of examiners to present pre-synopsis in one of the APS and IPS
20.	Presentation of pre-synopsis and its approval by the examiners
21.	Submission of thesis
22.	Sending the thesis to reviewers
23.	Receipt of reviews about thesis from the reviewers
24.	Final defence of the thesis
25.	Submission of final corrected thesis after defence
26.	Issue of provisional degree certificate
27.	Issue of degree certificate
	The steps and the progress evaluation of Ph.D. students by the committee/examiners/experts will be as per the provisions of Ph.D. regulations

Fee Structure and payment for regular/confirm admission – as per schedule specified in notification from time to time

Particulars	@Total Fees per annum (₹)
Tuition Fee	103600
Development Fee	15000
Examination Fee	4400
Laboratory Fees	25000
Library Fee	2000
Total (₹)	1,50,000/-
@ If paid provisional admission fee then should be debited from total fee	
Link for fees payment (Fees will be accepted via online payment gateway only and in no case, it can be paid using any other type of mode of payment and to any office/person)	https://myaccount.somaiya.edu/#/login

Payment of fees schedule for Provisional admission and subsequent years of Ph.D. programme			
Program Academic Year	Particulars	Amount in Rupees (₹)	Payment Schedule
First Year	Provisional admission fee/ First Instalment	75,000/-	Within eight days from the date of receiving the offer letter
	Second Instalment	75,000/-	Within six weeks from the commencement of the Academic Year
Second Year and Onwards	First Instalment	75,000/-	Within first week from the commencement of the new Academic Year
	Second Instalment	75,000/-	Within six weeks from the commencement of the new Academic Year
Link for fees payment (Fees will be accepted via online payment only and in no case it can be paid using any other mode of payment and to any office/person)		https://myaccount.somaiya.edu/#/login	
Note: Students have to pay the full fees of the program per year till the submission of the thesis			

Guidelines to do fee payment in Online Mode

There is a provision of ONLINE PAYMENT of college fees for student's convenience 24x7 on or before scheduled due date. Student will get notification from institute in three ways.

- 1) SMS
- 2) Email
- 3) Notification on myaccount.somaiya.edu portal

In notification there will be a link to make the payment. You just need to click on the link and follow below simple steps to make the payment.

STEP 1: Link will take you to myaccount.somaiya.edu portal. Use Somaiya SVV Net ID and password to login. Want to know more about myaccount.somaiya.edu click on https://somaiya.edu/media/pdf/SVVNetID_and_Email%20id.pdf

STEP 2: Login, select instalments and click on "Pay Now".

STEP 3: System will redirect to Online Payment Gateway. Fill the required information and follow payment options to complete the payment cycle.

STEP 4: After the successful payment, the payment receipt will be available at student's MyAccount portal

Admission Cancellation policy of Ph.D. programme

If the candidate has accepted the allotted seat by paying the fees and later chooses/decides to withdraw from the programme of study, then cancellation option is available at his/her MyAccount login.

The college shall follow the below system for deduction of fees against the cancellation request for the candidate.

Sr. No.	Point of time when application for admission cancellation is received by college	Applicable Deduction
1	15 days or more before the date of commencement of academic term	Rs 5,000/-
2	Less than 15 days before the date of commencement of academic term	10% of total fees
3	Less than 15 days from the date of commencement of academic term	20% of total fees
4	On or beyond 15th day but within six weeks from the date of commencement of academic term	50% of total fees
5	More than six weeks from the date of commencement of academic term	100% of total fees

Note:

- Total Fees for the program per year is Rs. 1,50,000/-
- Tentative date of commencement of every academic term will be announced on website.

Typical Sample example for further illustration to know about cancellation charges with reference to the date of commencement of term

Refer the **below example** for clarification of Ph.D. admission cancellation policy

Assume that the academic term commences from **15th July** of a particular academic year. Based on this assumption, following table illustrates important dates of cancellation policy:

Illustration:

Sr. No.	Point of time when application for admission cancellation is received by college	Applicable Deduction
1	Cancellation on or before 30th June (up to 11.59pm)	Rs 5,000/-
2	Any time from 1st July to 14th July (up to 11.59pm)	10% of total fees
3	Any time from 15th July to 28th July (up to 11.59pm)	20% of total fees
4	Any time from 29th July to 25th August (up to 11.59pm)	50% of total fees
5	After 25th August	100% of total fees

Process of getting documents submitted return

After verifications of documents, within 7 days, documents will be returned to students.

Contact

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