Somaiya School of Basic and Applied Sciences

Admission Manual

Ph.D. Programme Physics

July 2026

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

About Somaiya Vidyavihar University

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

We made this milestone after six decades of creating holistic teaching learning experience educational institutes of great repute. Somaiya Vidyavihar University has become a self finance – the first private University in Mumbai vide the Maharashtra Self-Financed Universities (Establishment and Regulation) Act 2013.

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. Somaiya Vidyavihar University is a place where students and faculty can explore " Freedom of Possibilities" , pursue your passion and above all, find yourself.

Our History and Vision

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

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.

In six 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, Dharma Studies ,Pure Sciences and Commerce & Business Studies, with more than 39000+ Candidates and 3000+ Faculties and staff on a throbbing 50 acre campus.

Our Founder, Shri K. J. Somaiya founded Somaiya Vidyavihar on 9th 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.

With PhD programmes in various faculties , we provide innovative platform for research aspirants to make a niche of their own to impact society and life.

About Research Center

The primary focus of the Ph.D. centre for Physics is to provide world class education, training and conduct innovative research at the interface of multiple disciplines to create high quality human resource in disciplinary and interdisciplinary areas of Physics in a globally competitive research milieu. Both basic and applied research topics will be addressed. The Ph.D Research programme has started from the academic year 2020- 21. Faculty members also collaborate with scientists from National Institutes in India and abroad. Their research components further strengthens & enrich the teaching programme. Owing to the best academic practices for the teaching programme, this Department has been able to generate excellent human resources in Physics. The department has an excellent track record of research in various areas of Physics with exposure to various themes. The Faculty members have excellent records of publication in journals with high impact factors. At present, we have Ph.D. guide with expertise in Nanoscience and nanotechnology, Materials Science, Photovoltaics and Solar Cells.

Students who study physics or engineering physics are prepared to work on forefront ideas in science and technology, in academia, the government, or the private sector. Careers might focus on basic research in Atomic physics, photonics or condensed matter physics. It also include teaching, medicine, law (especially intellectual property or patent law), science writing, history of science, philosophy of science, science policy, energy policy, government, or management in technical fields.

KEY FEATURES

- State-of-the-art laboratories
- Department with Ph.D.-qualified faculty
- Dynamic curriculum with right mix of various fields of Physical sciences
- Research-driven opportunities in Institutions in India and abroad
- Wide range of program and choice of open electives
- Opportunity for students to carry out inter-disciplinary research projects
- Workshops and Guest Lectures on a regular basis

1. Eligibility criteria for PhD Admission	
Subject to the conditions stipulated in the SVU Ph.D. Regulations,the following candidate are eligible to seek admission to the Ph.D. Programme	
1. Education Qualification	
i.	Master's degree (2 year or 1 year) 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.	Candidate seeking admission after a 4-year/8-semester bachelor's degree programme should have a minimum of 75% marks in aggregate or its equivalent as per UGC regulations
iii.	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.
iv.	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
v	**MUST** have qualified the **Ph.D. Entrance Examination and interview 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 to pay** the **application processing fee**.
vii	A No Objection Certificate (NOC) from the employer in case of those who are working / employed for applying to Ph.D. Programme
viii	If candidate wants to apply more than one subject then should submit separate / another application and **need to pay** the **application processing fee** per subject.

Eligibility at UG/PG Degree	
Branch of study at UG	Physics Electronics Maths Chemistry
Branch of study at PG	Physics Electronics Applied Physics Materials Science

Exemption Criteria for SVU Ph.D. Entrance Examination
Candidates who hold a JRF Fellowship with CSIR/UGC/ICAR/ ICMR and DBT examinations are exempted from appearing for Ph.D. entrance examination of SVU. For further details about exemption and category of students refer PhD regulation - Link **However, the candidates who fulfil the above criteria MUST fill the application form as per the schedule displayed on the website along with necessary fees.**

Pattern and syllabus of SVU Ph.D. Entrance Examination
The Ph.D and JRF Entrance examination will be common and will be at Somaiya Vidyavihar Campus, SVU, Vidyavihar, Mumbai -77
Pattern of entrance examination will be notified separately in due course of time

Syllabus for Entrance Examination

UNIT 1. Mathematical Physics: Vector algebra, Vector calculus, Linear algebra, matrices, linear differential equations, elements of complex analysis: Cauchy-Riemann conditions, Cauchy's theorems, singularities, residue theorem and applications; Fourier and Laplace transforms, elementary ideas about tensors.

UNIT 2. Classical Mechanics: Newton's laws, D'Alembert's principle, cyclic coordinates, variational principle, Lagrange's equation of motion, central force and scattering problems, rigid body motion; small oscillations, Hamilton's formalisms; Poisson bracket; special theory of relativity: Lorentz transformations, relativistic kinematics, mass-energy equivalence.

UNIT 3. Electromagnetic Theory: Electrostatics: Gauss's law and its applications, Laplace and Poisson equations, Magnetostatics: Biot-Savart law, Ampere's theorem. Electromagnetic induction. Maxwell's equations in free space and linear isotropic media; boundary conditions on the fields at interfaces. Scalar and vector fields and potentials, gauge invariance. Electromagnetic waves in free space. Dielectrics and conductors. Reflection and refraction, polarization, interference, coherence, and diffraction.

UNIT 4. Quantum Mechanics: Wave-particle duality, de-Broglie's hypothesis and its experiential verification, Postulates of quantum mechanics; uncertainty principle; phase velocity and group velocity of matter waves; Schrodinger time dependent and time independent wave equation; potential problems in one-, two- and three-dimensional, particle in infinite potential well, harmonic oscillator, hydrogen atom.

UNIT 5. Thermodynamics and Statistical Physics: Laws of thermodynamics; Maxwell's fundamentals thermodynamic relations, phase space; ensembles; partition function, Free energy and its connection with thermodynamic quantities, calculation of thermodynamic quantities; classical and quantum statistics; degenerate Fermi gas; Planck's radiation formula, black body radiation and Planck's distribution law; Bose-Einstein condensation; first and second order phase transitions.

UNIT 6. Atomic and Molecular Physics: Quantum states of an electron in an atom, Electron spin, Spectrum of helium and alkali atom. Energy levels of hydrogen atom, Zeeman and Stark effects; electric dipole transitions and selection rules; rotational and vibrational spectra of diatomic molecules; electronic transition in diatomic molecules, Raman effect; NMR, ESR, X-ray; He-Ne and NdYaG LASERs: Einstein coefficients, Optical pumping, population inversion, two and three level systems.

UNIT 7. Solid State Physics & Electronics: Elements of crystallography; diffraction methods for structure determination; bonding in solids; lattice vibrations and thermal properties of solids; free electron theory; band theory of solids: Fermi level, nearly free electron and tight binding models; metals, semiconductors and insulators; conductivity, mobility and effective mass; optical, Hall effect, dielectric and magnetic properties of solids; elements of superconductivity: Type I and Type II superconductors, Meissner effect, Liquid Crystals.

UNIT 8. Semiconductor devices: Diodes, Bipolar Junction Transistors, Field Effect Transistors; operational amplifiers: regulated power supplies; basic digital logic circuits, sequential circuits, flip-flops, counters, registers, A/D and D/A conversions.

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

Important Links
Tentative Timeline / Steps adapted for Ph.D. Programme - Link
Fee Structure of Ph.D. Programme - Link
Guidelines for Payment of Fees a Refund – Link
About course work - Link

Process of getting the documents submitted return
After verifications of documents, within 7 days, documents will be returned back to students.

Contact

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