K J Somaiya College of Engineering
Admission Manual

Ph.D. Programme
Mechanical Engineering

July 2024

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

Department of Mechanical Engineering offers a full time Under graduate program in Mechanical Engineering, Two PG Programs (M.Tech. EE and M.Tech. CAD/CAM / ROBOTICS) and a Doctoral programme focusing on niche research areas such as Thermal-Fluid sciences, Design engineering, Manufacturing engineering and Allied areas, etc. The department hosts a wide variety of research projects in these areas. We welcome you to this challenging field, which offers exciting opportunities in the development of more efficient fuels and fuel systems, new energy sources, energy conservation techniques and equipments, biomedical equipment, and other areas related to thermal and fluid science.

The Thermal and Fluids Science Engineering stream of the department offers wide opportunities for research with Refrigeration and Cryogenics, Heat and Mass Transfer applications, I C Engines, Alternative fuels, Heat exchanger design, Modeling of Thermal Systems, Industrial Applications of Heat and Mass Transfer concepts. HVAC, Energy Conservation and Management and Energy Audit, Air Pollution and Control, Generation and Characterization of Nano Particles, Design and Development of Renewable energy Systems (Solar, biomass and Wind), Design and Development of Industrial and Environmental Air Pollution Measuring and Control Devices.

The Design Engineering Group has expertise in various areas which includes Tribology, Mechanics of Composite Materials, Fracture Mechanics, Lubrication and Bearing, Machine dynamics, Fluid film bearings, Conical Hydrodynamic Journal Bearing, Product Design and development material science, metallurgy, wear analysis, design optimization etc. Department research focuses for improving experimental and numerical methods for reliable evaluation of new materials and systems.

The research areas under Manufacturing and Allied there are FEA, Mechatronics, Artificial Intelligence, Mass Customization, Additive Manufacturing, Medical Device Innovation, Engineering optimization, Industrial Engineering. Manufacturing Simulation, Multi-Criterion Decision Making, Design of Experiment, Multi body dynamics simulation, Robotics, Investment casting, Computational Fluid Dynamics, Big data analytics, smart manufacturing, sustainable practices and supply chain management. Students work on various challenges using latest modelling and analysis software making them ready for the Industry. Various statistical software are also available to help in analysing research data.

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.	**MUST** have qualified the **Ph.D. Entrance Examination and interview of SVU** – mandatory eligibility criteria for all candidates.
v.	**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**.
vi.	A No Objection Certificate (NOC) in prescribed format from the employer in case of those applying to Ph.D. Programme as a sponsored candidate and for all working Professional (Part time / Full time employment).

Eligibility at UG/PG Degree	
Branch of study at UG	Mechanical / Industrial / Production / Automobile / Manufacturing / Aerospace / Aeronautical and allied branches.
Branch of study at PG	Mechanical, Automobile, CAD/CAM, Aerospace, CAD-CAM-CAE, Aeronautical, Automotive, Machine Design, Energy Technology, Energy Engineering, Heat Power Engineering, Energy System, Energy Studies, Thermal Engineering, Design Engineering, Manufacturing Engineering, Manufacturing System Engineering, Mechatronics, Mechanical Design, Thermal Power Engineering, Production Engineering, Robotics & Automation, Metallurgy & Material Science, Product Design Development, Robotics, Industrial Engineering, Industrial Management, Product Lifecycle Management, Machine Tool Engineering, System & Control Energy Studies, Bio-Medical Engineering, Material Science, Manufacturing & Modelling Engineering, Material Engineering, System Science & Automation, Nano Science, Nano Engineering, Nano Technology, Industrial Tribology and Maintenance Engineering, CAD-CAM Robotics, Process Engineering, Automobile Design, Aerospace Science and Engineering

Exemption Criteria for SVU Ph.D. Entrance Examination

Qualified/Valid GATE Score in Mechanical Engineering

OR

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.

However, the candidates who fulfil 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: Mechanical Engineering

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

Paper-1 Qualitative Test – 40 marks (Subject Specific)

a) Essay Writing – 20 marks

b) Comprehension – 20 marks

(50% choice in selecting questions in paper 1)

Paper – 2 Subject Specific Test – 60 marks

a) Multiple Choice Questions – 20 marks (Attempt 20 out of 30 questions)

b) Subjective Questions – 40 marks (with 50% Choice)

Syllabus for Entrance Examination

Engineering Mechanics: Resultant of force system, Equilibrium of forces, Trusses, Friction, Kinematics of particles Kinetics of particle –Impulse and momentum (linear), Collisions.

Strength of Materials: Stress and strain, elastic constants, Poisson's ratio, Mohr's circle; thin cylindrical and spherical shells; shear force and bending moment diagrams; stresses in beams and columns, torsion of circular shafts; Euler's theory of columns;

Theory of Machines: Analysis of plane mechanisms; cams and followers; Flexible connector, gear trains; clutches, brakes, flywheel and governors; gyroscope,

Mechanical Vibrations: Linear Free and forced single degree of freedom vibration; longitudinal and torsional systems, vibration damping, critical speeds of shafts.

Machine Design: Design for static and dynamic loading; failure theories; fatigue strength, bolted and welded joints; shafts, spur and helical gears, Tribology: wear friction and lubrication, bearings, suspension system

Fluid Mechanics and Machinery: Fluid properties; fluid statics, forces on submerged bodies, control-volume analysis of mass, momentum and energy; fluid acceleration; Bernoulli's equation; viscous flow of incompressible fluids, boundary layer, Laminar Pipe Flow, elementary turbulent flow, flow through pipes, head losses in pipes, and fittings. Flow Measurements. Impulse and reaction Turbines (Pelton, Francis and Kaplan), velocity diagrams, calculation of power and efficiencies.

Thermodynamics: Thermodynamic systems and processes, properties of pure substances,

Zeroth , first and second law of thermodynamics; application of first and second law to flow and non-

flow processes. Availability and irreversibility; Properties of Steam, Vapor power cycles, Working and analysis of different types of Steam Nozzle and Steam turbines, regeneration and reheat. Gas power cycles: Air-standard, Otto, Diesel, and dual cycles, Fuel air cycles and actual cycles. Gas Turbines and Jet Propulsion. Methods to improve efficiency of Gas turbines. Testing and Performance of I C Engines and Various engine processes. Compressible fluid flow applied to nozzle, stagnation properties, Mach number and its analysis. Air refrigeration cycle and Vapor compression refrigeration cycle, Types of refrigerants; properties of moist air, basic psychrometric processes and analysis of air conditioning system.

Heat-Transfer: Modes of heat transfer; one dimensional heat conduction, heat transfer through fins; unsteady heat conduction, heat transfer in Internal and external flows: thermal boundary layer, dimensionless parameters in free and forced convective heat transfer, Free and forced convection heat transfer correlations, effect of turbulence; Heat exchanger performance, LMTD and Effectiveness - NTU methods; radiative heat transfer, Laws of radiation, Various surfaces involved in radiation, view factors, radiation network analysis; radiation heat transfer between two bodies, radiation shield and its application.

Engineering Materials: Structure and properties, phase diagrams, heat treatment. Principles of Casting, Forming and Joining Processes: Types of castings, design of patterns, moulds and cores; solidification and cooling; riser and gating design. Plastic deformation and yield criteria; fundamentals of hot and cold working processes; load estimation for bulk (forging, rolling, extrusion, drawing) and sheet (shearing, deep drawing, bending) metal forming processes; principles of powder metallurgy. Principles of welding.

Machining and Machine Tool Operations: Mechanics of machining; basic machine tools; single and multi-point cutting tools, tool geometry and materials, tool life and wear; economics of machining; principles of non-traditional machining processes; principles of work holding, design of jigs and fixtures.

Metrology and Inspection: Limits, fits and tolerances; linear and angular measurements; comparators; gauge design; interferometry; form and finish measurement; alignment and testing methods; tolerance analysis in manufacturing and assembly.

Computer Integrated Manufacturing: Basic concepts of CAD/CAM and their integration tools.

Production Planning and Control:

Forecasting models, aggregate production planning, scheduling, materials requirement planning.

Inventory Control: Deterministic models; safety stock inventory control systems.

Operations Research: Linear programming, simplex method, transportation, assignment, network flow models, simple queuing models, PERT and CPM.

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 on the University Website/ in Newspaper
2.	Acceptance of the applications for Ph.D. entrance examination along with application processing fee
3.	Display of list of eligible candidates for Ph.D. entrance examination and interview
4.	Execution of Ph.D. entrance examination and interview for all PhD programmes
5.	Display of list of eligible shortlisted candidates for provisional admission
6.	Provisional admission and payment of fees in accounts/admin office of the colleges.
7.	Orientation and beginning of the yearlong two semester course work
8.	Allotment of the guide at individual college level / department (within the first six months of provisional admission)
9.	Appointment of Examiners and chairman from Research Committee
10.	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, research proposal drafting & presentation and its evaluation.
11.	Research proposal presentation (Qualifying examination)
12.	Re-Examination for the semester I and II for unsuccessful candidates or for grade improvement
13.	Issue of mark sheets for course work of semester I and II
14.	Topic approval of the thesis work (after Qualifying course work examination)
15.	Registration for Ph. D programme
16.	Annual Progress Seminars (APS) every June/July and Intermediate Progress Seminar (IPS) every January/February of the academic year
17.	Approval of examiners to present pre-synopsis in one of the APS and IPS
18.	Presentation of pre-synopsis and its approval by the examiners
19.	Submission of thesis
20.	Sending the thesis to reviewers
21.	Receipt of reviews about thesis from the reviewers
22.	Final defence of the thesis
23.	Submission of final corrected thesis after defence
24.	Issue of provisional degree certificate
25.	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

Full Time Regular Ph.D. Students

· The student is basically non-working full-time regular student
· The student will have to pay Rs.50,000 fee per year – fee waiver is given as compared to other than full time regular students
· They can use all the facilities available in the college /department /section/ laboratory during their tenure of Ph.D. programme
· They are expected to report the college/department/section/laboratory as an when authorities/HOD/Guide/Dean/Chairperson BOS will call
· Full time regular student is expected to take teaching load as per NEP 2020 as allotted by the department/section during the academic term from time to time

About Course Work

The course work will be of one academic year (two semesters). It is expected that during the first semester the student will report the college/department/section/laboratory for attending the sessions as per Timetable. The student will have to complete total 14 credits (semester I) + 4 credits (semester II) = total 18 credits with CGPI as per the Ph.D. regulations to become eligible for the registration to Ph.D. programme.

Fee Structure of Ph.D. Program

(This is common across disciplines, all categories of students)

Particulars	@Total Fees per annum (₹)	
	First Year	Second Year Onwards
Tuition Fee	30,000/-	30,000/-
Development Fee	10,000/-	10,000/-
Examination Fee	10,000/-	10,000/-
Caution money Deposit (Refundable)	1,000/-	-----
Library Deposit (Refundable)	2,000/-	-----
Total (₹)	53,000/-	50,000/-

@ If paid provisional admission fee then should be deducted 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

Registration, Synopsis & Ph.D. Thesis Submission Fees	
Particulars	Amount
Registration fees	5,000/-
Approval of Synopsis of Ph.D. Thesis Topic	5,000/-
Ph.D. Thesis Submission	10,000/-
Total	20,000/-
Note: 1. Registration fees to be paid by the Ph.D. scholars before submitting the application for Registration for Ph.D. 2. Synopsis & Ph.D. Thesis Submission fees to be paid by the Ph.D. scholars before submission of synopsis.	

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	Total fee	53,000/-	Within eight days from the date of receiving the offer letter
Second Year and Onwards	Total fee	50,000/-	Within first week 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. Student 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_EmaiI%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. 50,000/- for full time regular students
- 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 the documents submitted return

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

Contact

Dr. Siddappa S. Bhusnoor
Ph.D. Coordinator, KJSCE
E-mail - **siddappabhusnoor@somaiya.edu / svu.phdcoordinators@somaiya.edu**

Dr. Manoj Janardan Pawar
Department Ph.D. Coordinator, KJSCE
E-mail - **manoj.jp@somaiya.edu**