



SRM

INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University u/s 3 of UGC Act, 1956)



ENGINEERING & TECHNOLOGY

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FROM THE **CHANCELLOR**

Engineering and science can give you the exhilarating power to become an active explorer, maker, doer, and help invent the future.

SRMIST's engineering programs endeavour to be at the forefront of innovation. They also foster multi-disciplinary collaborations aimed at solving the most pressing global problems.

Our mission is to seek solutions to global challenges by using the power of engineering principles, techniques and systems. We believe that engineers should not only possess deep technical excellence, but also nurture creativity, cultural awareness and entrepreneurial skills that come from exposure to science, business, medicine and other disciplines – all an integral part of the SRM experience.

Our goal is to deliver world class, solutions driven programmes that inspire curiosity and generate new knowledge and discoveries. Our collaboration with over 50 of the world's best universities and 215 corporates, strengthens our academic and research programs.

SRMIST is committed to pioneering innovations in research, transferring discoveries to the broader community, and educating tomorrow's leaders and entrepreneurs.

Welcome to SRM!

A handwritten signature in black ink, appearing to read "T.R. Paarivendhar".

Dr. T.R.Paarivendhar
Chancellor

ENGINEERING & TECHNOLOGY



What began as SRM Engineering College offering 4 programmes in 1985, SRMIST has evolved into a multi stream university with the Engineering and Technology faculty alone offering over 40 undergraduate and 35 post graduate programmes across 4 campuses. Three of the campuses, namely Kattankulathur, Ramapuram and Vadapalani are located in Chennai, the capital city of Tamil Nadu, one of the most progressive states in India. The fourth campus being at NCR Ghaziabad, near Delhi.

With students in India seeking more inter-disciplinary programmes and flexibility in course curriculum, SRMIST addressed this demand by completely leaving the option of program path to the students. A student shall have an option of choosing any one of the following pathways (i) Major (ii) Major with Specialization (iii) Major with Minor or Major with specialization and a Minor. The core philosophy that is practised in SRMIST as part of teaching-learning process is Inter Disciplinary Experiential Active Learning (IDEAL)

The Engineering & Technology faculty comprises of 7 Schools and 19 Departments. Each School is headed by a Dean and comprises of various Departments of Engineering, clubbed on the basis of their domain expertise.

PROGRAMMES OFFERED AT **SRMIST**

SRMIST - Kattankulathur

B.TECH. PROGRAMMES

- Aerospace Engineering
- Artificial Intelligence
- Automobile Engineering
- Automobile Engineering w/s Automotive Electronics
- Automobile Engineering with specialisation in Vehicle Testing (in collaboration with GARC)
- B.Arch
- B.Des (Interior Design)
- Biomedical Engineering
- Biotech w/s in Genetic Engineering
- Biotechnology
- Biotechnology w/s Regenerative Medicine
- Chemical Engineering
- Civil Engineering
- Civil Engineering w/s in Computer Applications
- Computer Science and Business Systems (in collaboration with TCS)
- Computer Science and Engineering
- CSE w/s in AI and ML
- CSE w/s in Big Data Analytics
- CSE w/s in Cloud Computing
- CSE w/s in Computer Networking
- CSE w/s in Cyber Security
- CSE w/s in IOT
- CSE w/s in IT
- CSE w/s in Software Engineering
- CSE with specialisation in Block Chain Technology
- CSE with specialisation in Gaming Technology
- ECE w/s in Biomedical Engineering
- ECE w/s in Electronics and Instrumentation
- ECE with specialisation in Cyber Physical Systems

- ECE with specialisation in Data Science
- Electrical and Computer Engineering
- Electronics and Communication Engineering
- Electronics and Computer Engineering
- Electronics and Instrumentation Engineering
- Electrical and Electronics Engineering
- Genetic Engineering
- Information Technology
- Mechanical Engineering
- Mechanical Engineering with specialisation in Artificial Intelligence (Offered only at Vadapalani campus)
- Mechatronics Engineering
- Mechatronics w/s in Robotics
- Nanotechnology
- Software Engineering

M.TECH. PROGRAMMES

- Architectural Design
- Electric Vehicle Technology (in collaboration with Valeo)
- Automotive Hybrid Systems Engineering
- Big Data Analytics
- Biomedical Engineering
- Biotechnology
- Chemical Engineering
- Cloud Computing (in collaboration with Virtusa)
- Computer Aided Design
- Computer Integrated Manufacturing
- Computer Science and Engineering
- Construction Engineering and Management

- Electronics and Control Engineering
- Embedded System Technology
- Environmental Engineering
- Food and Nutritional Biotechnology
- Food Safety and Quality Management
- Genetic Engineering
- Geotechnical Engineering
- Information Security and Cyber Forensics
- Internet of Things
- Mechatronics Engineering
- Microelectronics
- Nanotechnology
- Power Electronics and Drives
- Power Systems
- Remote Sensing and Geographical Information system
- Robotics
- Solar Energy
- Structural Engineering
- Telecommunication Networks
- VLSI Design
- Wireless and Mobile Communication Systems
- Master of Design (Interior Design)

POST GRADUATE DIPLOMA & DIPLOMA PROGRAMME OFFERED

- Advanced PG Diploma Life Science Technology

B.TECH. PROGRAMMES (PART-TIME)

- Automobile Engineering
- Civil Engineering
- Mechanical engineering
- Electrical & Electronics Engineering

SRMIST - Ramapuram

B.TECH. PROGRAMMES

Existing Courses continuing during 2020-2021

- Civil Engineering
- Computer Science & Engineering
- CSE with specialization in Artificial Intelligence & Machine Learning
- CSE with specialization in Big Data Analytics
- CSE with specialization in Cyber Security
- CSE with specialization in Internet of Things (IOT)
- Computer Science & Business Systems (in partnership with TCS)
- Electrical & Electronics Engineering
- Electronics & Communication Engineering
- Electronics & Computer Engineering
- Information Technology
- Mechanical Engineering
- Mechanical & Automation Engineering

Course to be closed during 2020-2021

- Electrical & Computer Engineering

New Course proposed during 2020-2021

- Biomedical Engineering

M.TECH. PROGRAMMES

Existing Courses continuing during 2020-2021

- Computer Aided Design
- Structural Engineering

New Course proposed during 2020-2021

- Construction Engineering and Management

ARCHITECTURE

Existing Courses continuing during 2020-2021

- B.Arch
- B.Des - Interior Design
- M.Arch

B.TECH. PROGRAMMES (PART-TIME)

Existing Courses continuing during 2020-2021

- Civil Engineering

- Computer Science & Engineering

- Electrical & Electronics Engineering
- Electronics & Communication Engineering

- Mechanical Engineering

Course to be closed during 2020-2021

- Computer Aided Design

M.TECH. PROGRAMMES (PART-TIME)

Existing Courses continuing during 2020-2021

- Structural Engineering
- Computer Science Engineering
- Embedded System Technology
- Power Electronics & Drives
- Computer Integrated manufacturing
- MBA

New Courses proposed during 2020-2021

- Big Data Analytics
- Construction Engineering and Management
- Computer Aided Design

SRMIST - Vadapalani

B.TECH. PROGRAMMES

- Computer Science & Business Systems (in partnership with TCS)
- Computer Science & Engineering
- CSE with specialisation in Artificial Intelligence & Machine Learning

- CSE with Big Data Analytics

- Electronics & Computer Engineering

- Electronics & Communication Engineering

- Mechanical Engineering

- Mechanical & Automation

- Mechanical Engineering w/s in AI

B.TECH. PROGRAMMES (PART-TIME)

- Mechanical engineering
- Electronics & Communications Engineering
- Computer Science & engineering

SRMIST - Delhi-NCR, Ghaziabad

B.TECH. PROGRAMMES

- Automobile Engineering
- Civil Engineering
- Computer Science & Business Systems (in partnership with TCS)
- Computer Science & Engineering
- CSE with specialisation in Artificial Intelligence & Machine Learning

- CSE with Big Data Analytics

- CSE with specialisation in Cloud Computing

- CSE with specialisation in Cyber Security

- CSE with specialisation in Internet of Things (IOT)

- Electrical & Electronics Engineering

- Electronics & Computer Engineering

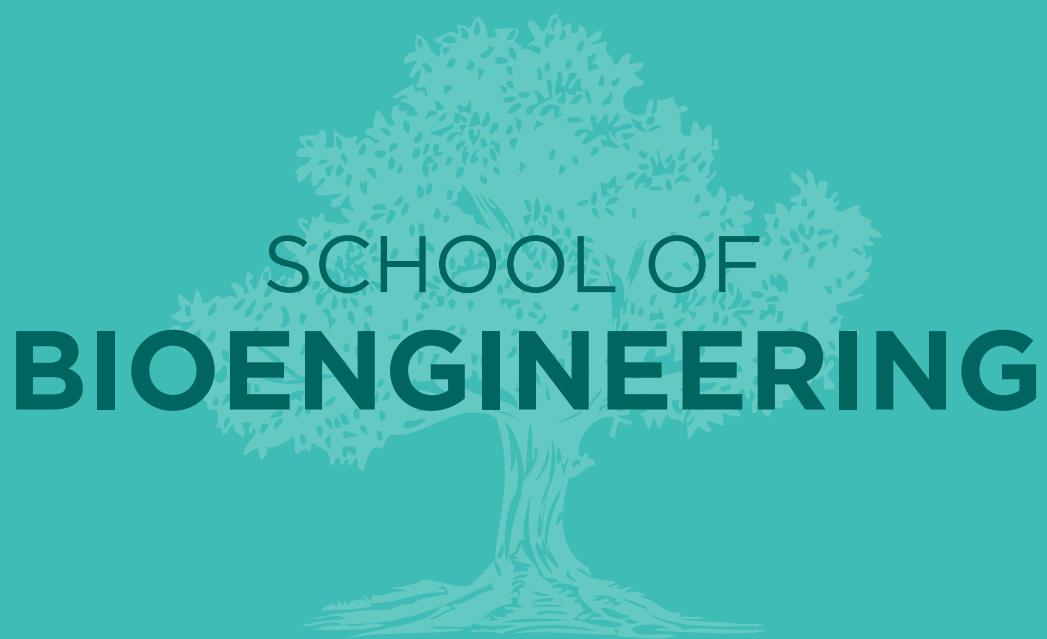
- Electronics & Communication Engineering
- Mechanical Engineering

M.TECH. PROGRAMMES

- Computer Science & Engineering
- VLSI Design

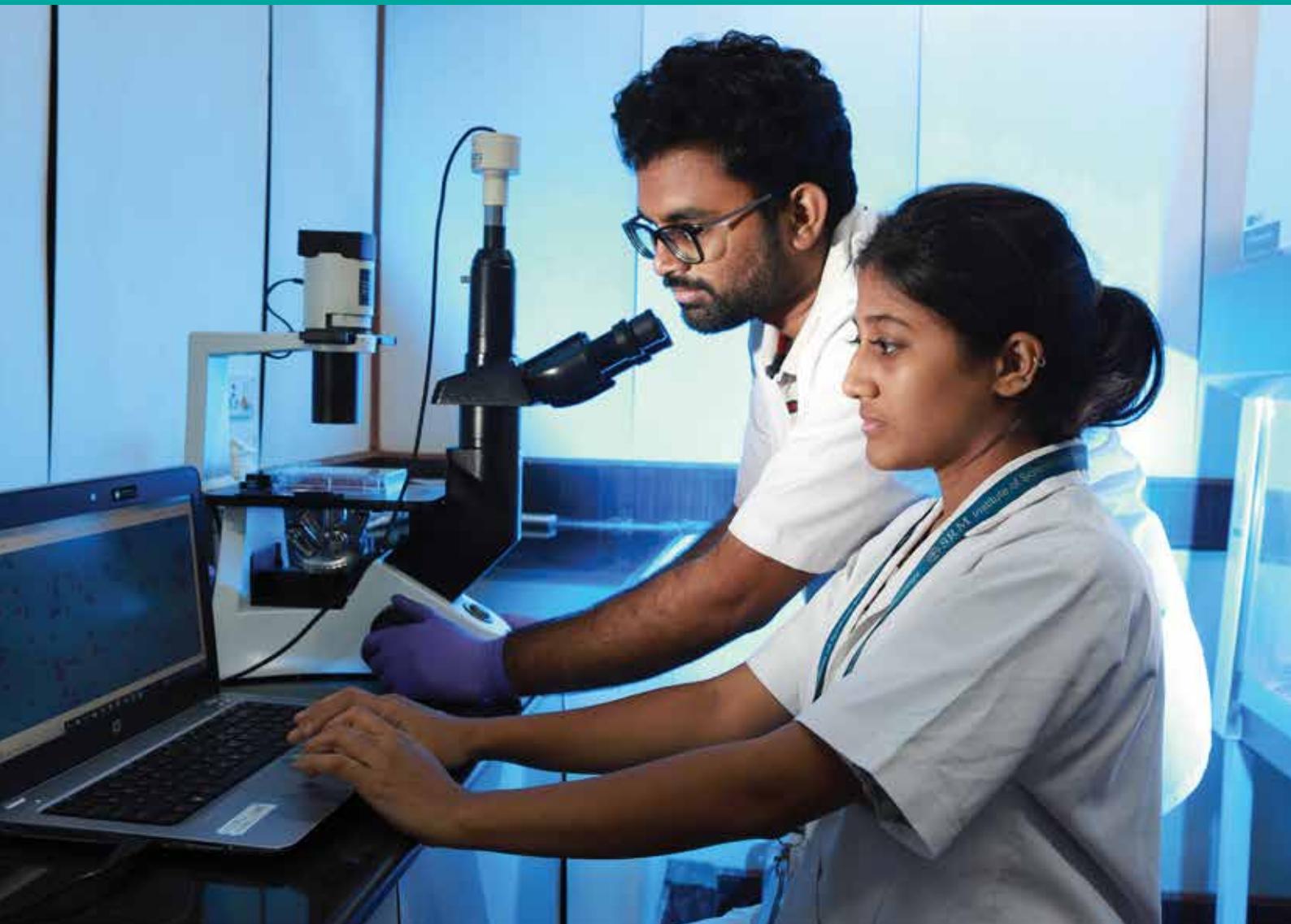
M.Tech. by Research is offered by all Departments and across Four Campuses





- DEPARTMENT OF BIOMEDICAL ENGINEERING
- DEPARTMENT OF BIOTECHNOLOGY
- DEPARTMENT OF CHEMICAL ENGINEERING
- DEPARTMENT OF FOOD PROCESS ENGINEERING
- DEPARTMENT OF GENETIC ENGINEERING
- SRM - DBT PLATFORM

DEPARTMENT OF BIOMEDICAL ENGINEERING



Undergraduate Programme

- B.Tech. Biomedical Engineering

Postgraduate Programme

- M.Tech. Biomedical Engineering

Biomedical Engineering is the branch of engineering which combines medical and biological sciences with engineering principles to design and create equipment, devices and software used in healthcare. It brings together knowledge from various sources of medicine and engineering to conduct research needed to solve clinical problems. Biomedical engineers with in-depth understanding of living systems and technology design electrical circuits, software to run medical equipment and computer simulations to test new therapies, and construct artificial body parts, such as the hip and knee joints.

The Department of Biomedical Engineering was established in 2004, in association with SRM Medical College and Research Institute, Kattankulathur, Chennai. It has emerged as one of the best institutions for the programme in the country. It has turned out 830 graduate and 240 postgraduate biomedical engineers so far. The Department has 15 competent and dedicated faculty members with diverse research interests focused on applying cutting edge technology to find solutions in fields ranging from life sciences to medical engineering. It has signed MoUs with the Kalam Institute of Health Technology, Andhra Pradesh Medtech Zone, Vishakapatnam, for technology transfer and project commercialisation and with start-ups like Aarca Research, Bangalore, for product design and validation.

Facilities

Students and faculty of the Department benefit from the facilities at the SRM Medical College, Hospital and Research Centre such as the research lab equipped with speciality instruments, state-of-the-art laboratory facilities and smart classrooms for hands-on training and practical knowledge transfer.

The lab facilities available are:

- Biomedical Instrumentation Lab
 - Bio-Signal Processing Lab
 - Virtual Instrumentation Lab
 - Medical Image Processing Lab
 - Human Anatomy and Physiology Lab
 - Digital & Integrated Circuits Lab
 - Electronic Devices & Circuits Lab
 - Centre for Biomedical Engineering and Multidisciplinary Research
-

Research

The thrust areas of research are:

1. Product and system design (Diagnostic, Therapeutic)

Aim: To design and test products and system for diagnosis of diseases and treat abnormalities. Major focus on non-invasive technologies.

2. Medical image processing and analysis

Aim: To process medical images and analyse them to pave the way for easy and computer-aided diagnosis of abnormalities and diseases.

3. Bio-signal processing and analysis

Aim: To process bio-signals and analyse them for early and effective computer-aided diagnosis of abnormalities and diseases.

4. Biomaterial synthesis and tissue engineering

Aim: To synthesise and develop biomaterials that can be used with tissue engineering and replacements and help in the design of long-lasting, bio-compatible implants.

Funded Projects

The Department is actively involved in research, with eight teams being funded from SRMIST for various projects.

- On-campus medical college, hospital and research centre
- Hospital visits to understand real time working of medical equipment
- Projects and research work oriented towards non-invasive and early diagnosis in healthcare
- Collaboration with biomedical industry
- Alliances with medical institutions
- Semester Abroad Programme (SAP) where students complete one semester in a foreign university
- Socially relevant rural health screening camps
- Strong alumni network that facilitates good placement opportunities

Career Prospects

With growing health consciousness and use of advanced technological solutions in the medical sector, biomedical engineering has become one of the most sought-after career fields both within and outside the country.

The prime recruiters of biomedical engineers are the healthcare management and healthcare manufacturing sectors. Companies where our alumni are placed include Philips Healthcare, Siemens, Baxter, Abbot India, Medtronic, Apollo Hospitals Enterprise Limited and GE Healthcare. However, the opportunities are not restricted to these fields.

Healthcare teams in Government and private hospitals include clinical / biomedical engineers.

Biomedical engineers also work in universities and research facilities of national / international educational institutions like the University of Sheffield, Cornell University etc. There is also huge scope for entrepreneurship in the biomedical engineering field, as healthcare is an evergreen and constantly evolving arena.

B.Tech. Biomedical Engineering

B.Tech. Biomedical engineers with in-depth understanding of living systems and technology will be able to design electrical circuits, software to run medical equipments or computer simulations to test new therapies, construct artificial body parts, such as hip and knee joints. Students benefit from facilities like in campus SRM Medical College, hospital and research centre for on the field

training, research lab equipped with speciality instruments, state of the art laboratory facilities that would provide hands on and practical knowledge transfer, smart classrooms.

Core Courses

- Human Anatomy and Physiology for Engineers • Biomedical Sensors and Measurement Devices
- Biomaterials and Artificial Organs • Biomedical Signals and Systems • Diagnostic Imaging Systems • Medical Instrumentation • Biocontrol Systems • Biomedical Signal Processing
- Microprocessor Systems in Medicine • Medical Image Processing • Diagnostic and Therapeutic Equipments • Neural Networks and Fuzzy Logic Systems in Medicine • Human Assist Devices and Implant Technology

Electives Courses

- Bio photonics • Applied Optoelectronics in Medicine • Biomedical Laser Instruments • Hospital Information System • Home Medicare Technology • Design and Development of Medical Devices
 - Machine Vision in Medical Technology • Radio therapeutic Equipments • Biomedical Nanotechnology • Rehabilitation Robotics • Biomechanics • Machine Learning Techniques in Medicine • Medical Radiation Safety • X-Ray Imaging and Computed Tomography • MRI and its Clinical Applications • Neurorehabilitation and Human Machine Interface • BioMEMS
 - Computational Methods for Signal and Image Processing • Nuclear Imaging • Acoustics and Optical Imaging • Body Area Networks and Mobile Healthcare
-

M.Tech. Biomedical Engineering

M.Tech. Biomedical engineering brings together knowledge from various sources of medicine and engineering to conduct research needed to solve clinical problems. It pavesway for diverse research interests focused on applying cutting edge technology to find solutions in various fields from life science to medical engineering. Different streams of electives offered enable the graduates to have clear focus and indepth knowledge.

Core Courses

- Anatomy and Physiology • Advances in Biomedical Instrumentation • Biomedical Signal Analysis • Methods of Medical Image Analysis • Physiological Modelling and Computation
- Biomechanics and Finite Element Analysis

Elective Courses (Streams)

A. National Instruments Certified Biomedical Engineer: • Labview - Graphical System Design Platform • System Analysis Techniques • Intelligent Instrumentation • Medical Robotics and Automation

B. Application Specialist in Radiology: • Specialized X-Ray Medical Equipments • Computer Assisted Tomography Imaging • Ultrasound Medical Imaging • Magnetic Resonance Imaging

C. Sales & Service Biomedical Engineer: • Design of Medical Devices • Biomedical Laser Technology • Quality Control and Standards for Biomedical Devices • Troubleshooting in Medical Instruments

D. Biomedical Entrepreneur: • Health Care and Hospital Management • Introduction to Medical Product Regulation • Telemedicine and E-Health • Medical Ethics

E. Research and Development Biomedical Engineer: • Biomaterials for the Design of Medical Devices • Advances in Rehabilitation Engineering • Neural Engineering and Modeling • Computational Fluid Dynamics in Medicine

DEPARTMENT OF BIOTECHNOLOGY



Undergraduate Programmes

- B.Tech. Biotechnology
- B.Tech. Biotechnology with specialization in Regenerative Medicine

Postgraduate Programme

- M.Tech. Biotechnology

The Department of Biotechnology was established in 2003 at SRM with the aim of providing high-quality education and enabling cutting-edge research in the field of biological engineering. The curriculum and syllabi are frequently reviewed to reflect current developments and trends. The Department constantly facilitates strong interdisciplinary research in sectors such as pharmacology, healthcare, diagnostics and therapeutics, bioprocesses, environment, agricultural and plant and animal sciences. This results in the development of socially and economically important technologies and products in the field of healthcare, agriculture and environmental engineering.

Facilities

State-of-the-art facilities have been provided in every lab for academic and research activities. Besides, an SRM-DBT partnership platform has been established for skill development in advanced life sciences.

Research

Various research grants have been generated worth a total of Rs 2,594.01 lakhs. Several funded projects are underway.

- DST-FIST-sponsored department
- DST, DST-SERB, DBT and ICMR have funded research laboratories
- Among 43 faculty members, 38 are Ph.D holders
- A number of students have secured admission for higher studies in prestigious institutions in India and abroad, and others are well placed in companies and R&D laboratories

Career Prospects

Both graduates and postgraduate students have great job opportunities in pharmaceutical companies, R&D laboratories and CSIR laboratories. They also have the opportunity to become entrepreneurs. In addition, students are well-placed to become academicians / researchers in higher educational and research institutes.

B.Tech. Biotechnology

The Core and Elective subjects have been designed to improve the learning process and impart knowledge of biology and technology. Every core subject has a laboratory where hands-on training and technical skills are imparted, to transform students into technocrats and facilitate research and higher

education in the field of biotechnology. These subjects provide knowledge in biological and chemical sciences, enabling the pursuit and promotion of cutting-edge research in select fields of biotechnology.

Core Courses

- Biochemistry • Cell Biology • Microbiology • Genetics and Cytogenetics
- Molecular Biology • Immunology • Bioprocess Principles • Plant Biotechnology • Gene Manipulation and Genomics • Bioprocess Engineering
- Animal Biotechnology • Protein Engineering and Proteomics • Bioseparation Technology • Comprehension

Electives (Any 6 courses)

Sub-Stream: Medical Biotechnology: • Developmental Biology • Cellular and Molecular Neuroscience • Metabolic Disorders • Infectious Diseases • Cancer Biology • Physiology of Stress

Sub-Stream: Pharmaceutical Biotechnology: • Pharmaceutical Biotechnology
• Bioinformatics • Drug Discovery and Drug Designing • Marine Biotechnology
• Vaccine Biotechnology • Molecular Basis of Drug Action

Sub-Stream: Plant & Food Biotechnology: • Plant Nutrition and Physiology
• Plant Hormones and Signalling • Pathogenesis Related Proteins in Plants
• Food Science and Nutrition • Therapeutic Compounds from Plants • Food Safety and quality Management

Sub-Stream: Bioprocess Technology: • Enzyme Engineering and Technology
• Membrane Technology • Industrial Fermentation Technology • Bioreactor Design • Bioprocess Modelling and Simulation • Bioprocess Plant Design

Sub-Stream: Environmental Biotechnology: • Environmental Biotechnology
• Industrial Waste Management • Bioenergy • Environmental Microbiology & Metagenomics • Bioremediation technology • Environmental Biosensors

B.Tech.

Biotechnology with Regenerative Medicine

This course imparts basic knowledge on biomaterials, stem cells and immune systems from the perspective of engineers and provides opportunities to learn the clinical relevance of stem cells along with biomaterials. It also offers a basic understanding of the potency of stem cells in any cell-specific lineage at the cellular and molecular levels.

Core Courses

- Biochemistry • Cell Biology • Microbiology • Genetics and Cytogenetics
- Molecular Biology • Immunology • Bioprocess Principles • Plant Biotechnology • Gene Manipulation and Genomics • Bioprocess Engineering
- Animal Biotechnology • Protein Engineering and Proteomics • Bioseparation Technology • Comprehension



Electives (Any 6 courses)

- Molecular Cell Biology • Cell Communication Signalling • Stem Cell Technology • Biomaterials in Tissue Engineering • Nanotechnology in Regenerative Medicine • Tissue Engineering for Regenerative Medicine
- Bioreactors in tissue Engineering • Developmental Biology in tissue Engineering • Advanced Immunology and Vascular Tissue Engineering

M.Tech. Biotechnology

The objective of the programme is to impart knowledge with emphasis on gene cloning, genomics and proteomics, and other basic molecular techniques.. The students will enhance their technical skills through hands-on training in bioprocess, downstream processing and the application of computers in bio-technology. It would ultimately enable the students to apply the techniques in industrial applications.

Core Courses

- Biomolecules • Bioprocess Technology • r-DNA Technology • Bioprocess Modelling and Simulations • Molecular Immunology • Advanced Bioanalytical Techniques • Seminar • Industrial Training • Project Work Phase I • Project Work Phase II

Electives (Any 6 courses)

- Biology of Cancer • Stem Cell Technology • Clinical Trial Management
- Plant Production Technology • Animal Cell as Bioreactors • Bioprocess Plant Design • Pharmaceutical Biotechnology • Biological Treatment of Waste Water • Green Energy Technology • Microbial Technology.

DEPARTMENT OF CHEMICAL ENGINEERING



Undergraduate Programme

- B.Tech. Chemical Engineering

Postgraduate Programme

- M.Tech. Chemical Engineering

The Department was established in 1995 with a B.Tech. Chemical Engineering programme. Since then, it has evolved into a full-fledged academic unit, sending out into the professional world chemical engineers with B.Tech., M.Tech. and doctoral degrees. With well-equipped state-of-the-art laboratory infrastructure, cutting-edge industry-relevant curriculum, excellent computational facilities, active industry-academia collaborations, interdisciplinary research opportunities, funded projects and socially-relevant research publication and patents, the Department equips students with the necessary skill-sets and expertise to function as industry and academia-ready chemical engineers and technologists.

Facilities

The faculty comprises academicians with doctoral degrees, trained in IITs and Universities abroad. The Department possesses well-equipped process engineering and technology laboratories for teaching-learning and research. These include Chemical Reaction Engineering, Heat and Mass Transfer, Mechanical Operation, Process Control and Process Modelling and Simulation. The curriculum also provides hands-on training with advanced process simulation software tools such as Aspen Plus, AutoCAD, MATLAB, COMSOL, Ansys CFD etc. as well as open-source software such as SciLab, DWSIM etc.

Research

The biochemical and bioprocess technology group of researchers work on converting biomass to biofuels and other bioproducts. The environmental science and technology team works on the detection, monitoring and remediation of environmental pollutants as well as novel membrane-based desalination and water treatment technologies. A third group of researchers is working on computational chemical engineering with modern process software tools for analysis, modelling and simulation of complex transport processes. A fourth group works on solving problems with electrochemical science and technology. The Department has been given funding by the Departments of Science and Technology and Biotechnology, Government of India. It currently has four funded projects underway with a total outlay of around Rs. 1 crore.

- A Semester Abroad Program (SAP) with students studying in NTU, Singapore; University of Wisconsin – Madison, USA; University of California-Davis, USA, Stanford USA and University of Malaysia, Pahang.

Career Prospects

Employers cover a broad range of industrial sectors, including oil and gas prospecting and extraction, petroleum refining, petrochemicals, renewable energy, pharmaceuticals, fine and heavy chemicals, agrochemicals, electronic and hi-tech materials (semiconductor industry), food, pulp and paper, plastic and metals, fibres and polymers. Many chemical process engineers also work for consultancy and engineering, procurement and construction (EPC) organizations. Some recently-placed alumni work in leading industries such as Hindustan Unilever Ltd., Tata Chemicals, Reliance Petrochemicals, JK Tyres, Phillips Carbon Black Limited, Larsen and Toubro Ltd., Petrofac Ltd. etc. in India. Many alumni are also working in USA, Europe and Australia.

B.Tech. Chemical Engineering

The B.Tech. Chemical Engineering programme curriculum with its outcome-based pedagogy for theory and experimental and computational laboratory course works is designed to impart the skills-sets and expertise necessary for graduating chemical engineers to work and excel in any process engineering and technology industry. The out-of-departmental and departmental elective courses, Semester Abroad Programme, industrial internships, multi-disciplinary projects, research-based project work etc. provide students the flexibility to tailor their programme towards a particular outcome, including a future in a particular process technology industry, research and development positions, higher studies in India and abroad or a teaching career.

Core Courses

- Chemical Process Calculation • Heat, Mass and Momentum Transfer • Chemical Reaction Engineering • Chemical Engineering Thermodynamics • Process Modelling and Simulation
- Process Control and Instrumentation

Electives Courses

- Chemical Process Technology • Biochemical and Bioprocess Engineering • Environmental Science and Technology • Energy Engineering and Technology
-

M.Tech. Chemical Engineering

M.Tech. Chemical Engineering is an advanced programme with lab-associated professional core course works and a research project component. The curriculum and the outcome-based evaluation methodology are designed to equip graduate chemical engineers with advanced proficiency in chemical engineering and technology theory and practice. It introduces students to experimental and/or computational research and is expected to lead to technical outcomes such as publications, patents etc. This programme imparts skills-sets necessary to work in industrial research and process development, technical services, project engineering.

Core Courses

- Advanced Transport Phenomena • Advanced Chemical Reaction Engineering • Multi component Distillation and Reactor Design • Advanced Heat Transfer • Advanced Process Dynamics and Control • Computer-Aided Process Plant Design

Electives Courses

- Solvent Extraction Engineering • Process Plant Simulation • Optimization of Chemical Processes
- Waste Water Treatment • Modern Separation Processes • Industrial Catalysis

DEPARTMENT OF FOOD PROCESS ENGINEERING



Postgraduate Programmes

- M.Tech. Food & Nutritional Biotechnology
- M.Tech. Food Safety & Quality Management

The Department of Food Processing Engineering was started in the year 2003. Well-equipped laboratories were set up for Food Microbiology, Food Biochemistry, Food Analysis, Fruits and Vegetable Processing. A Bakery and Confectionery and a DST-FIST supported Food Engineering and Properties Lab were also started.

The Department offers two postgraduate degrees - M.Tech in Food and Nutritional Biotechnology that prepares scholars to become knowledge-driven professionals by providing a learning environment strongly focused on collaborative and interdisciplinary research, and M. Tech in Food Safety and Quality Management which has wide employment scope in the current scenario. In addition, it also offers a Ph.D programme in Food Process Engineering.

Experienced Associate and Assistant Professors who have developed many food processing processes, equipment and value-added food products make up the faculty. As food processing is an interdisciplinary subject in nature, the Department shares staff from the Departments of Chemical Engineering, Biotechnology and Mechanical Engineering.

Faculty members present research papers at international / national conferences and publish articles in peer-referred high-impact factor journals. The Department maintains close links with various food processing industries in India and abroad.

Facilities

The Department has advanced equipment like Hunter calorimeter, Spectrophotometer, Ultrasonic cleaner, Spray drier, Freeze drier, Super critical fluid extractor and Viscometer, besides basic machinery and equipment.

Research

The Department of Science and Technology (DST), Government of India and National Research Foundation (NRF), South Africa (Bilateral) have awarded the Department a research project with a budget of Rs. 30 Lakhs.

Some other funded research projects are in progress too.

- DST-FIST supported “Food Engineering Laboratory”.
- A few one-credit courses offered by industry experts

M.Tech. Food & Nutritional Biotechnology

After successful completion of the programme, students will be well-versed in the fundamentals of food science and nutrition, food chemistry and biochemical changes during processing and preservation, and nutraceuticals. They will be able to understand sensory evaluation of food. Students will demonstrate the ability to work with modern tools and equipment to analyse food composition and identify microorganism responsible for food spoilage.

Students will also develop specific skills based on their interests, in bakery and confectionery, meat, poultry and fish processing, food fermentation, and dairy products processing. They will also be able to apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing.

Core courses

- Food Science and Nutrition • Food Engineering • Analytical Techniques in Food Processing
- Post-Harvest Technology of Fruits & Vegetables • Applied Biotechnology • Food Safety and Quality Management

Electives

- Food Microbiology and Fermentation Technology • Biochemistry of Processing and Preservation • Meat, Poultry and Fish Processing Technology • Advanced Dairy Process Biotechnology • Nutraceuticals and Functional Foods • Bakery and Confectionary Technology

Career Prospects

The Department prepares students to pursue leadership, technical and management positions in a variety of food-based industries. Students have obtained prestigious placements at leading companies such as Britannia, Tasty Foods, Perfetti, Pepsi, Coco-Cola, Hatsun Agro Pvt. Ltd., Lottee, Mega foods Pvt. Ltd., Aachi Masala, Cavin Care, Nestle, ITC Foods etc. Students also have huge opportunities in the Government sector, such as in Food Corporation of India, FSSAI etc.

M.Tech. Food Safety & Quality Management

After completing this programme, students will be knowledgeable about the food chemistry and microbiological aspects of food. The course focuses on the priorities and needs of consumers, retailers, manufacturers, food industries, hotel industries and regulators.

Students will be able to work with modern tools and equipment to analyse food composition and identify microorganisms responsible for food spoilage. They will be equipped to work as food auditors, food inspectors, quality chemists, etc.

Students will also be able to apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing. They will also be well-versed in regulations governing the manufacture and sale of food products.

Core Courses

- Advanced Food Chemistry • Food Microbiology and Microbial Techniques • Advanced Food Processing and Preservation Techniques • Food Toxicology • Food Safety and Quality Auditing
- Food Laws and Legislations

Electives Courses

- Logistics and Supply Chain Management • Food Additives and Ingredients • Food Safety systems in dairy industries • IPR and International Trading • Total Quality Management of Food Industries • Food Safety and Quality Assurance for Bakery and Confectionery industries • Food Safety and Quality Assurance for Meat, Poultry and Sea food industries

Career Prospects

Students have the opportunity to pursue value-added courses like FOSTAC, ISO 22000 FSMS and HACCP certification along with their regular curriculum. After completing these professional courses, they can become certified Internal Food Safety Auditors (as per Food Safety and Standard Regulations, FSSAI, 2011). They can also find employment in the Government and private sector in areas like:

- Manufacturing Industries (Nutraceutical and Functional Food, Food Production Plants, Spices and Spice Processing Industries, etc.)
- Food Processing Industries (Dairy, Bakery & Confectionary, Fruit and Vegetables, Beverage Industries etc.,)
- Retail Industry (Reliance)
- Hospitality Industries (Star Hotels, Restaurants, etc.,)
- Government regulatory bodies such as FSSAI, APEDA, MPEDA and EIC (Export Inspection Council)

DEPARTMENT OF GENETIC ENGINEERING



Undergraduate Programme

- B.Tech. Biotechnology (Specialization in Genetic Engineering)

Postgraduate Programmes

- M.Tech. in Genetic Engineering

The rapid scientific progress that led to the development of newer DNA sequencing technologies and gene editing approaches have underscored the necessity to combine the classical field of genetics with fast-emerging fields like genomics and genome editing. Genetic Engineering is the backbone of biotechnology. The opportunities for a genetic engineer in clinical and applied genetics today and in the future are boundless.

Started in the year 2004, the Department of Genetic Engineering aims to produce professionals who excel in the field of genomics and gene editing. It has state-of-the-art laboratories and 26 highly-experienced and dedicated faculty members, all with Ph.D degrees. Faculty and students regularly visit various Indian research institutes like the IITs, Indian Institute of Science, etc. for collaborative research.

Knowledge is imparted to students in a highly interactive way. Hands-on training in advanced molecular biology techniques and cutting-edge research opportunities are both provided.

Facilities

The Department has the facilities to carry on research in various fields of life sciences. These include:

- Transgenic Greenhouse
- Next-Generation DNA Sequencing Platforms
- Biological Mass Spectrometry
- Zebrafish
- Fluorescent and light microscopy

Equipment available in the Department include:

- Illumina Next Generation Sequencer (NextSeq500)
- Real-time PCR Machines
- Gene Gun
- Chromosome Karyotyping System
- Automated chromatography (FPLC & HPLC)
- Gas chromatography
- Inverted Fluorescence Microscope
- Bioanalyzer

Research

The Department has a total of 15 labs, 11 of which are funded by various agencies like DBT, DST-SERB, ICMR and BIRAC. Collaborative and interdisciplinary research is active in the areas of genomics, human genetics, bio-energy, plant, animal and microbial genetics.

The Zebrafish Cancer Model, with a funding of Rs 170 Lakh from DBT, and the SRM-DBT partnership platform for advanced life sciences technologies, worth Rs. 1583.50 Lakh are two of the 31 research projects, together worth over Rs. 25.35 crore, which are underway in the Department.

- **Semester Abroad Program:** So far, 264 students from the Department of Genetic Engineering have gone to 54 different foreign universities and institutions, including Harvard University, Yale University, Cambridge University, NUS, Cold Spring Harbor Lab, German Cancer Center, University of California Davis, and Ohio State University.
- **Higher studies:** Over the last three years, more than 40 B.Tech students have enrolled for post graduation or Ph.D programmes in various foreign universities and 65 students are studying in prestigious Indian institution like IIT, IISc Bangalore, CCMB-Hyderabad, IIHMR Jaipur, etc.

- **Quality and experienced faculty:** About 75% of the faculty members have research experience in reputed foreign institutions like Harvard University, Johns Hopkins University, Texas A&M University etc.

Career Prospects

Genetic engineering has a wide scope, with about USD 42 billion worth of business worldwide. After completing the courses, students can work in medical and pharmaceutical industries, research and development departments, agricultural sector, genetic engineering firms, biomedical companies, etc. Genetic engineering graduates are required in Government as well as private organizations. With the number of biotech firms increasing in India, the future is bright.

B.Tech.

Biotechnology with specialization in Genetic Engineering

The B.Tech. programme comprises foundation courses in Biology and Engineering. Subsequently, students take up advanced courses like Recombinant DNA Technology, Human Genetics and Gene Therapy. There are research-focussed laboratory sessions which enhance intellectual and interactive skills to analyse research-related problems.

Core Courses

- Biochemistry, Microbiology • Molecular Biology • Plant Biotechnology • Animal biotechnology
- Immunology • Genetics and Cytogenetics • Recombinant DNA Technology • Human Genetics
- Bioprocess Principles • Enzyme Engineering • Environmental Biotechnology • Cancer Biology
- Gene Therapy

Electives

- Human Physiology • Plant Physiology • Genes and Diseases • Animal Developmental Biology
 - Plant Biochemistry • Medical Microbiology • Genetic Counselling
-

M.Tech.

Genetic Engineering

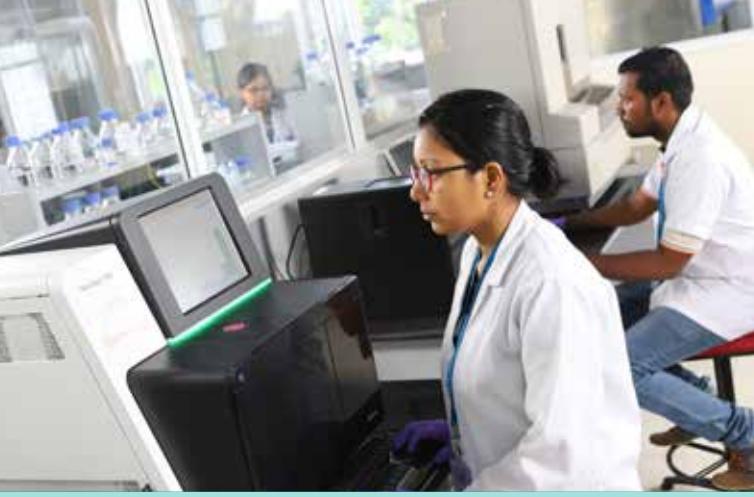
The M.Tech programme equips students to think broadly and critically about scientific problems. We teach our students to conduct hypothesis-oriented investigations on the heritable basis of various biological characters, gene interactions, regulation of gene expression and the molecular basis of genetic diseases. The programme offers training by integrating foundations of classical and modern genetics with focused laboratory sessions. Students admitted to the course are eligible for a fellowship or stipend of Rs. 12,400/- per month.

Core Courses

- Regulation of Gene Expression • Human Genetics • Plant Genetic Engineering • Developmental Genetics • Cancer Genetics

Electives Courses

- Human Physiology • Stem Cell Biology • Clinical Genetics • Human Genomics
- Pharmacogenetics Neurogenetics • Plant Physiology • Biochemistry of Secondary Metabolites
- Plant Developmental Genetics • Plant Genomics • Plant Environment Interaction • Molecular Plant Breeding • Microbial Genomics • Molecular Virology • Molecular Pathology of Infectious Diseases



SRM-DBT PLATFORM FOR ADVANCED LIFE SCIENCE TECHNOLOGIES

Postgraduate Programmes

- Advanced Postgraduate Diploma in Life Science Technologies (Duration - 1 year)

SRM-DBT Platform for Advanced Life Science Technologies was started in the year 2015 by SRM Institute of Science and Technology in collaboration with Department of Biotechnology, Govt. of India. This department holds core facilities in Genomics, Proteomics, Molecular Platforms and Bio-imaging. A specific pathogen free animal house facility was also established to house small animals. The Department offers Advanced Postgraduate Diploma in Life Science Technologies, a one year course that is focused on skill development in advanced technologies.

The Department is endowed with experienced faculty having rich industrial and academic experience and who have developed innovative techniques using advanced scientific equipment in life science research applications. The Department shares staff from the Departments of Biotechnology and Genetic Engineering, SRM Research Institute and SRM Medical College. Faculty members present research papers at international/national conferences and publish articles in peer-referred high-impact factor journals. The Department maintains close links with various academic institutes, research institutes and industries in India and abroad

Facilities

The Department is equipped with advanced equipment such as NextSeq 500 (NGS system), Capillary Sequencer, Bioplex 200 (Multiplex Elisa), Real time and Digital PCRs, Microarray, Fluorescence Microscope, IVIS Live animal imaging system and MALDI – TOF MS/MS. The Department offers research services for academic and industrial organisations.

Research

The Department offers research services in the fields of Next Generation Sequencing, Capillary Sequencing, Microarray analysis, Gene expression and variation analysis, Multiplex ELISA, Peptide mass fingerprinting, fluorescence microscopy etc. The Department also provides consultancy services for student's projects

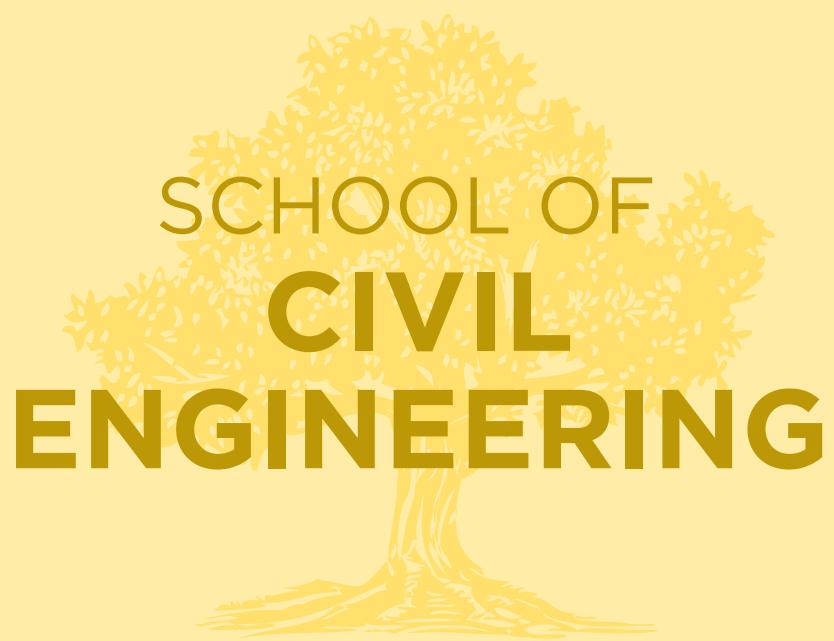
Advanced Postgraduate Diploma in Life Science Technologies

Advanced Postgraduate Diploma in Life Science Technologies is aimed to produce highly skilled professionals to handle advanced laboratory equipments such as Next Generation Sequencing (NGS), Mass Spectrometer, Digital PCR, Microarray, Fluorescent Microscope etc. Students would be provided with a monthly stipend of Rs. 15,000/- during the entire duration of the course.

Career Prospects

The course is designed in consultation with peers from industry and academia to empower the students with techniques to be used in industries and advanced research laboratories. This course can help the students to secure employment in biotech industries and other advanced research facilities.





- DEPARTMENT OF CIVIL ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING



Undergraduate Programmes

- B.Tech. Civil Engineering
- B.Tech. Civil Engineering with Computer Applications

Postgraduate Programmes

- M.Tech. Construction Engineering & Management
- M.Tech. Environmental Engineering
- M.Tech. Geotechnical Engineering
- M.Tech. Remote Sensing & GIS
- M.Tech. Structural Engineering

The Department of Civil Engineering was established in the year 1985. It pulls out all the stops to create outstanding engineers. It is equipped with advanced teaching techniques and learning aids for undergraduate students and state-of-the-art research facilities for postgraduate students and doctoral candidates. The B.Tech Civil Engineering programme was accredited by NBA twice since 1988. The NBA accredited the M.Tech Structural Engineering programme in 2001 with an 'A' grade. A total of 31 batches of students have graduated since 1989 and are working in various reputed industries, and R & D organisations, besides in academia.

Accreditations

The B.Tech Civil Engineering programme at the Kattankulathur campus in Chennai was accredited by EAC [Engineering Accreditation Commission] of ABET, USA (www.abet.org) in 2011 and re-accredited in 2015.

Facilities

Students and research scholars have access to well - equipped labs covering 15,000 sq. ft. These labs are:

- Advanced Structural Testing Lab
- Bentley powered Computer Drawing and Designing Lab
- CADD Lab
- Centre for Advanced Concrete Research
- Concrete and Highway Lab
- Construction Engineering Lab
- Earthquake Research Cell (ERC)
- Environmental Engineering Lab
- Environmental Science and Technology Lab
- Hydraulics and Fluid Machinery Lab
- Remote Sensing and GIS Lab
- Soil Mechanics Lab
- Strength of Materials Lab
- Structural Engineering lab
- Survey Lab
- Transportation Laboratory

Software

ERDAS Imagine, ArcGIS, VOXLER, STARTER, AutoCAD Civil 3D, Autodesk, StaddPro, Civil Designer, HEC-RAS, MicroStation, Microsoft Project, Primavera (Popular project management software), RFEM, SAFE Softtree Optimal, Visioncivil, AutoTURN, ADAPT BUILDER, MIDAS, ETABS.

Research

Research activities of the institute were accelerated from the year 2003 onwards. Extensive research facilities were created. The students and staff are encouraged to innovate through quality research in emerging areas. Each specialisation has its own laboratories and facilities, equipped to handle high-end research. At present, 118 scholars are pursuing Ph.D degrees. There are several ongoing research projects. At present there are 50 full-time research scholars, 54 part-time internal scholars and 32 external scholars pursuing their research in various Civil Engineering specializations. No of research papers published in Scopus and Indexed journals will be around 400 as on Jan 2020, H Index :10 ; Highest impact factor 5.8(SCI).

Funded Projects

Faculty members in Department of Civil Engineering have either completed or are working on projects with a total outlay of Rs. 225 lakhs funded by Government and private establishments such as the Department of Science and Technology, Indian Trust for Art and Cultural Heritage etc.

- Student chapters like SRM Society of Civil Engineering, American Society of Civil Engineering (ASCE), ICI, and ACI are actively functioning
- ASCE student chapter was listed among the top 10 chapters worldwide in 2019
- ICI student chapter was placed first among regional chapters
- Industry powered Labs like the Bentley Systems-powered lab
- National and International collaborative research projects
- Student Abroad Program in MIT, USA; University of California, Davis; Dongguk University, N.Korea; NUS, Singapore; University of Dundee, UK; University of West England, Bristol and University of Melbourne, Australia.
- MOUs with CBRI, Roorkee, UNIMAS, Malaysia, University of New castle, Australia etc.,
- Industrial collaboration with HECS, Bentley Software and Satyug.

Career Prospects

- Site Engineers in Leading Construction Companies like L&T
- Graduate Engineer Trainees
- Site supervisors
- Entrepreneurs
- Assistant Engineers in various government sectors
- Writing UPSC Examinations

Placements are possible in L&T Constructions, Ultratech, Indiabulls, CDD, HECS, ITD Cementation, ERA Groups, Eversendai, CCCL, Saipem Projects, Afcons, Trident, Etc.,

B.Tech. Civil Engineering

The objective of the B.Tech Civil Engineering course is to help graduates perform as professional engineers in diverse fields and gradually move into teamwork and leadership positions. It also aims to facilitate students to pursue higher studies in civil engineering, management and other related fields and contribute to the development of the profession, nation and society.

Core Courses

- Engineering Geology • Fluid Mechanics • Mechanics of Structures • Strength of Materials
- Engineering Surveying • Structural Analysis • Computer Aided Structural Analysis • Hydraulic Engineering and Design • Design of RC and Steel Structures • Environmental Engineering and Design • Hydrology and Water Resources Engineering • Geotechnical Engineering • Highway Engineering and Design • Construction Engineering and Management • Minor and Major Projects, Industrial training.

Elective Courses

- Advanced Design of RCC • Modern Civil Engineering Economics • Modern Tools in Engineering Surveying • Emerging Trends in Steel Design • Advanced Prestressed Concrete Structures
- Bridge Engineering

B.Tech.

Civil Engineering With Computer Applications

The course facilitates academics and research in challenging engineering problems by applying modern engineering tools and software in the various sub-disciplines of Civil Engineering viz. Structural Engineering, Construction Engineering and Management, Environmental and Water Resources Engineering, Geotechnical Engineering and Transportation Engineering. The curriculum of this course is framed in such a way that the undergraduate program imparts mastery in core civil engineering courses besides disseminating knowledge on humanities, management and social science, basic science and engineering courses. Paramount importance is also given to computer applications in various civil engineering specializations.

Core Courses

- Engineering Geology • Fluid mechanics • Mechanics of Structures • Engineering Surveying
- Structural analysis • Hydraulic Engineering and Design • Design of RC and Steel structures
- Environmental Engineering Design • Hydrology and Water Resources Engineering
- Geotechnical Engineering • Highway Engineering Design • Construction Engineering and Management

Elective Courses

- Computer Application in Structural Engineering • Computer Application in Construction Engineering and Management • RS and GIS application in Civil Engineering • Computer Application in Geotechnical and Transportation Engineering • Computer Application in Water Resources and Environmental Engineering • Fundamentals of computing
-

M.Tech.

Construction Engineering & Management

The Construction Engineering and Management course has progressed extensively over the last two decades. The course curriculum has been designed to cater to the ever-expanding demands of research and industry, by zealously assimilating the views of stakeholders.

Core Courses

- Modern structural materials and system design (theory and practice) • Project formulation and appraisal
- Quantitative techniques in construction management • Statistical methods and queuing theory
- Career advancement course for engineers - i • Construction planning, scheduling and control
- Advanced construction techniques • Computer application in construction management
- Career advancement course for engineers - ii • Interdisciplinary electives
- Industrial training • Career advancement course for engineers

Elective Courses

- Construction equipment and management • Building acoustics and noise control • Gis in construction engineering and management • Construction economics and financial management
- Quality control and safety management • Construction project management • Advanced concrete technology
- Management information system • Building services • Energy conservation techniques in building construction • Shoring, scaffolding and form work
- Construction personnel management • Resource management and control in construction
- Contract laws and regulations • Energy efficiency buildings • Maintenance and rehabilitation of structures
- Disaster management • Materials management

M.Tech. Environmental Engineering Programme

The M.Tech Environmental Engineering Programme deals with advanced techniques of water and wastewater treatment. The curriculum is framed to cover every area of treatment and its application, which helps candidates to gain high-level information in the field. This is a good option for candidates who wish to pursue Ph.D.

List of Sophisticated Instruments in Laboratory: • Mars extractor • Solid phase extractor • Ultrasonicator • Centrifuge • Orbital incubator • Rotor evaporator • Spectrophotometer • Flame photometer • High volume air sampler

Eligibility Norms for Admissions: B.Tech. in Civil Engg. / Chemical Engg. / Bio-Tech Engg./ Biomedical Engg. / Food Processing (or) any equivalent degree in the above Disciplines.

Core courses

- Transport of Water and Wastewater
- Environmental Microbiology and Ecology
- Solid Waste Management
- Unit Operation and Processes in Water and Wastewater Treatment
- Air and Water Quality Modeling
- Design and Operation of Water and Wastewater

Elective Courses

- Environmental Chemistry
 - Industrial Wastewater Treatment
 - Noise Pollution and Control
 - Cleaner Production
 - Air Pollution Control
 - Environmental Impact Assessment
 - Energy Efficiency Buildings
 - Career Advancement Course for Engineers
-

M.Tech. Geotechnical Engineering

The Geotechnical Engineering Masters programme is designed to support high-level training and enhance both technical and managerial skills. The courses focus on essential aspects like physical, chemical and mechanical properties of soils and rocks; ground investigation; problematic soils, field and laboratory testing and site investigation; analysis, design and construction of foundations, retaining walls, tunnels, embankments and slopes: include methods of ground reinforcement and improvement. It provides a sound knowledge of soil and rock mechanics, current civil engineering design and construction practices. Research projects allow detailed study into a particular area of geotechnical engineering and focus on laboratory testing, numerical modelling and analysis or management of geotechnical processes / applications. It enables planning and directing ground investigations and laboratory testing, interpreting results and proposing optimum methods of design and construction. Government and private sector job opportunities are available to geotechnical engineers.

Core Courses

- Experimental Geo mechanics
- Strength and Deformation Behavior of soils
- Shallow Foundations
- Geo mechanics and soil behavior
- Deep Foundation
- Ground Improvement

Elective Courses

- Geo synthetics in civil engineering
- Reinforced soil structures
- Earth Pressure and Earth retaining structures
- Earth and Rock filled dams
- Environmental Geo technology
- Foundations of expansive soil
- Marine Foundations
- Pavement Engineering
- Remote sensing and its applications in geotechnical engineering

M.Tech.

Remote Sensing & Geographical Information System

The aim of the M.Tech. (RS&GIS) course is to provide in-depth understanding of remote sensing, satellite image analysis, Geographic Information System (GIS) and GPS technologies and their applications in natural resources survey and monitoring including agriculture and soils, forestry and ecology, geology and mineral resources, water resources, marine resources, urban and regional planning, atmospheric studies and disaster management.

Core Courses

- Remote Sensing and Its Techniques • Digital Image Processing and Techniques • Geological Remote Sensing and techniques • GIS and Software • GIS Data Analysis • DBMS

Elective Courses

- Basics and Digital Cartography • GPS & Electronic Surveying • Microwave Remote Sensing and Applications • Hyperspectral Remote sensing and Applications • Digital Photogrammetry and Applications • Lidar Remote sensing and Applications • Non-Topographic Photogrammetry • RS & GIS for Urban and Regional Planning • RS & GIS for Hydrology and Water Resources • RS & GIS for Agriculture and Forestry • RS & GIS for Environmental RS2112 RS & GIS for Ocean Engg & coastal Management • RS & GIS for Disaster Management • RS2114 Web GIS

Supportive Course

- GEO-Statistical methods

M.Tech.

Structural Engineering

M.Tech. Structural Engineering Programme is a 2-year full-time post-graduation programme, dealing with research areas such as Concrete Technology, Structural Systems (2D&3D), Adoptive in filled Frames, Sustainable Construction Materials, Coconut Shell Concrete, Renovation of Heritage Structures, Steel Concrete Composites, Biomimics, Bacterial Concrete and High Temperature Behaviour of Concrete Material & Systems. Structural engineers combine science and art to design and build infrastructure to resist natural and man-made forces. Buildings, bridges, stadiums, off-shore and other civil facilities are the core focus of structural engineers. It also shares interests with mechanical, aerospace and naval engineering for the design of often large, complex systems, including power plants, pipelines, aerospace vehicles and ships / submarines.

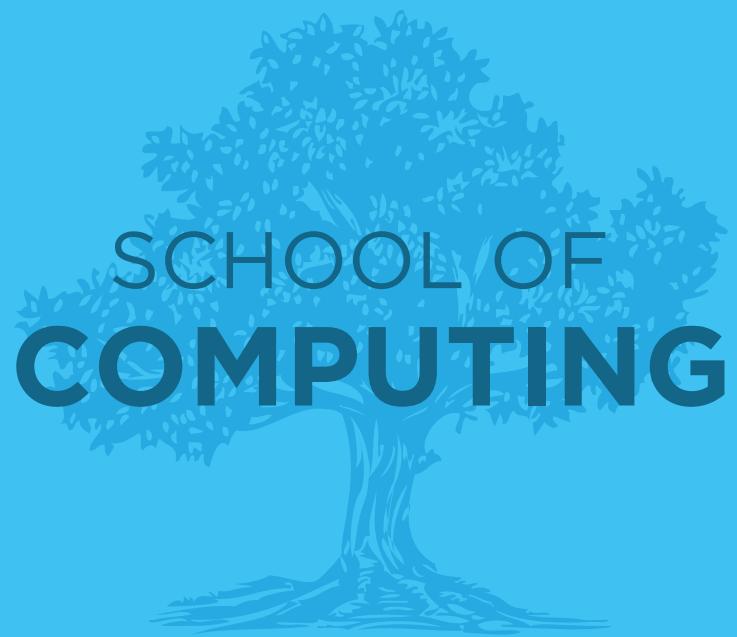
Core Courses

- Matrix Computer Method of Structural Analysis • Structural dynamics • Theory of elasticity and plasticity • Applied Mathematics • Career Advancement Course For Engineers - I and II
- Advanced reinforced concrete structures • Advanced steel structures • Finite element method with computer application • Project Work – Two Phases (Phase I & II)

Elective Courses

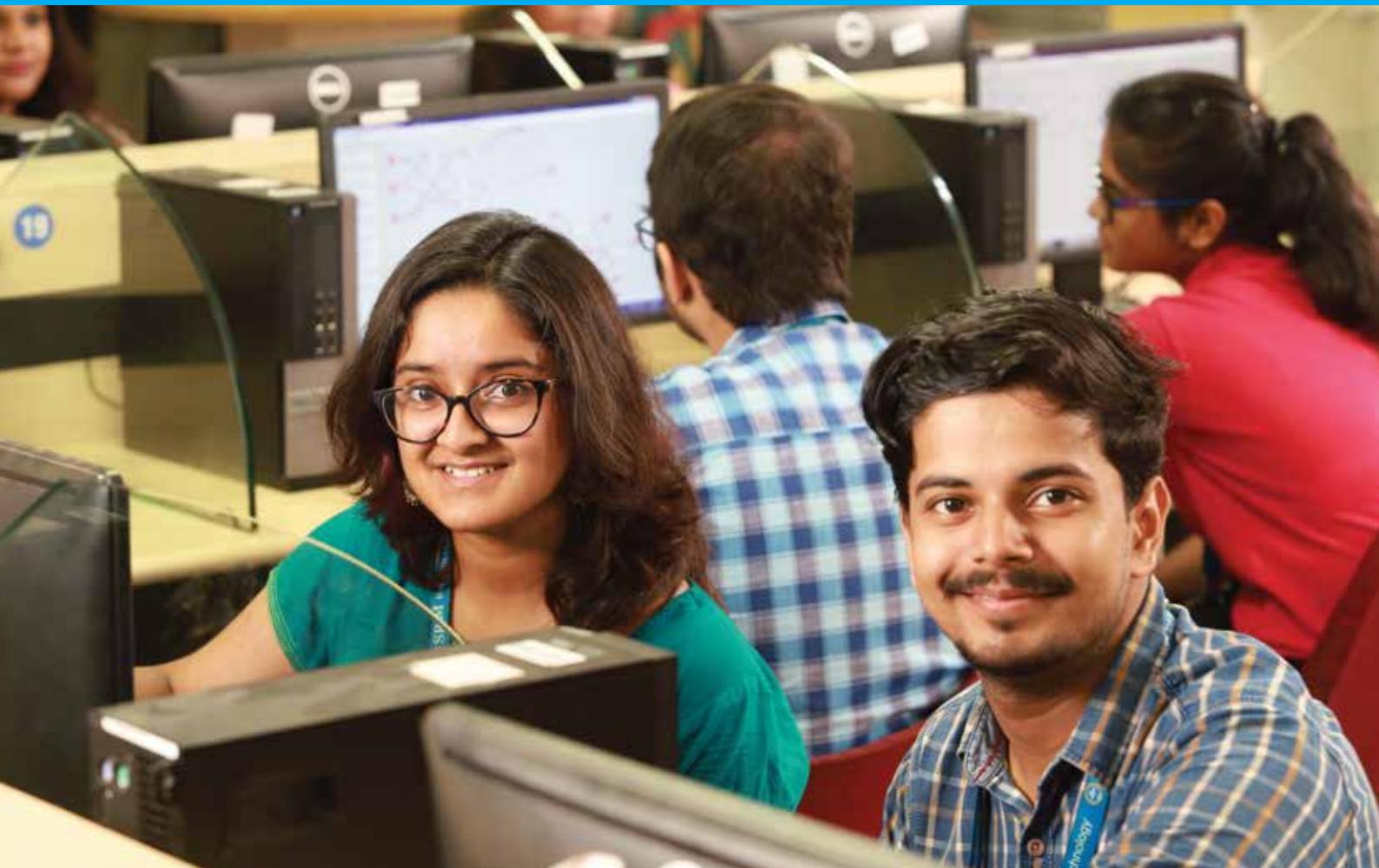
- Soil Structure Interaction • Aseismic Design of Structures • Computer Aided Design • Concrete Technology & Special Concretes • Design of Bridges • Design of Reinforced Concrete Foundations • Design of Shell and Folded Plate Structures • Design of Steel-Concrete Composite Structures • Advanced Analysis and Design for Wind Earthquake and other Dynamic Loads
- Design of Tall Buildings • Disaster Resistant Structures • Offshore Structures • Maintenance and Rehabilitation of Structures • Prestressed Concrete Structures • Optimization in Structural Design • Stability of Structures • Theory of Plates • Infrastructure Engineering for sanitary structures • Theory of Shells • Dam Safety • Bridge Maintenance Management • Ground Improvement Techniques • Seismic Retrofit of Buildings • Fluid Structure Interaction (Mathematical Approach) • Engineering Fracture Mechanics • Analysis and design of structural sandwich panels • Experimental Techniques and Instrumentation





- DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
- DEPARTMENT OF INFORMATION TECHNOLOGY
- DEPARTMENT OF SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING



Undergraduate Programmes

- B.Tech degree in Artificial Intelligence
- B.Tech. Computer Science and Engineering
- B.Tech. CSE (Specialization in Artificial Intelligence & Machine Learning)
- B.Tech. CSE (Specialization in Big Data Analytics)
- B.Tech. CSE with Specialization in Block Chain
- B.Tech. CSE (Specialization in Cyber Security)
- B.Tech. CSE (Specialization in Cloud Computing)
- B.Tech. CSE (Specialization in Computer Networking)
- B.Tech. CSE with Specialization in Gaming
- B.Tech. CSE (Specialisation in Information Technology)

- B.Tech. CSE (Specialization in Internet of Things)
- B.Tech. CSE (Specialisation in Software Engineering)
- B.Tech. Computer Systems & Business Systems (in collaboration with TCS)

Postgraduate Programmes

- M.Tech. Computer Science & Engineering
- M.Tech. Cloud Computing – empowered by Virtusa
- M.Tech. Internet of Things

Part-Time Programme

- B.Tech. Computer Science & Engineering

The Department of Computer Science and Engineering, SRM's Flagship Department, was instituted with a mission to advance and enhance the field of Computer Science and Engineering and related domains by building the intellectual capital of society. With a vibrant student community of over 6000 and 190 experienced and dedicated faculty, the Department has won many accolades and recognition. It has been attracting more and more students every year with its various specialisation programmes tailored to meet the needs of the industry.

Faculty members are part of Special Interest Groups, and handle subjects in the domain, guide projects, organise workshops / training programmes, publish papers, apply for patents and funding, create dataset repositories, etc.

Accreditations

The B.Tech. (CSE) Programme of the Kattankulathur campus at Chennai has been accredited by the Institution of Engineering and Technology (IET), UK.

Facilities

The Department of Computer Science & Engineering provides extensive computing resources for research and education. These include more than 2500 high-end Linux, Windows, SUN and Apple workstations and laptops. Our network communications include a fibre-optic backbone, offering connectivity within the Tech Park labs and University building labs.

Research

Facilities include

- Wireless Sensor Testbed
- SRM Tejas Software Defined Network Testbed
- Brain Computer Interfacing Lab
- Natural Language Processing/Machine Learning Lab

Funded Projects

The Department has got research funding from leading agencies like DRDO, DST and DSIR. Six Government-funded projects worth Rs. 138 lakhs have been sanctioned. Five SRMIST-funded projects worth Rs. 9.65 lakhs are in progress

Trends covered

- Block Chain Technology
- Data Science and Machine Learning
- Robotic Process Automation
- Virtual Reality (VR) and Augmented Reality (AR)
- Intelligent Apps
- 3D Printing
- Quantum Computing

Curriculum and syllabus as per the guidelines of AICTE and ACM/IE.EE Flexible Choice-based Curriculum

Learning is enhanced through

- Integrated Theory and Lab mandatory courses
- Indigenous e-LAB model for practicals
- Special Electives and Open Elective courses
- Multidisciplinary design projects
- Online MOOCs & Certification courses Credited
- Pedagogical and Scenario-based teaching / learning processes
- Innovative feedback-based curriculum updates
- Industry-supported curriculum design and delivery
- Industry-supported Labs

Collaborations (National and International)

1. Virtusa – Centre of Excellence in Cloud Computing, offering M.Tech (Cloud Computing)
2. Tata Consultancy Services – offering B.Tech (Computer Science and Business Systems)
3. Design Intellect – offering One Credit Course on Software Craftsmanship
4. Tejas Networks – Setting up of Research Software Defined Testbed
5. Mitosis Technologies – Student Internships and Projects
6. University of Missouri Kansas, USA – Semester Abroad Programme

Career Prospects

Computer Science and Engineering is one of the most high-paying employment sectors, and is full of opportunities. With deeper specialisation, students will have even more rewarding career options. There is always a great demand for computer professionals in the field of software development. Students with a Bachelor's degree in Computer Science and Engineering can command higher pay packages than others in software industries. Apart from taking up employment, they also have many options to pursue higher studies or carry out research in foreign universities.

B.Tech Artificial Intelligence

B.Tech degree in Artificial Intelligence (AI) is the study and design of intelligent systems that transforms large amounts of data to perceive the environment and take appropriate decisions, to enhance human capabilities. This degree lays emphasis on acquiring broad-based knowledge of all aspects of AI along with applications on few vertical domains. The six vertical domains proposed are Smart Healthcare, Robotics, Business Analytics, Infrastructure, Cyber Security and Intelligence, and Agriculture. The curriculum includes coursework in mathematics, probability and statistics, Arts & Humanities, computer science, machine learning, and ethics/sociology. Having a bachelor's degree in artificial intelligence may open the door to new and exciting career paths. Possible jobs include data scientist, machine learning specialist, computer engineer, teaching and marketing.

B.Tech. Computer Science & Engineering

The core programme in CSE comprises courses in both hardware and software domains, which cater to industry needs in any core or applied fields of computer science.

Core Courses

- Data Structures and Algorithms • Object-Oriented Design and Programming • Computer Organization and Architecture • Design and Analysis of Algorithms • Operating Systems
- Software Engineering and Project Management • Advanced Programming Practice • Formal Language and Automata • Computer Networks • Database Management Systems • Compiler Design • Artificial Intelligence • Computational Logic • Neuro Fuzzy and Genetic Programming
- Digital Image Processing • Network Security • Data Mining and Analytics • Distributed Operating Systems • Biometrics • Pattern Recognition Techniques • Natural Language Processing • Information Storage and Management • Wireless Sensor Networks • Network Protocols and Programming

Elective Courses

- Network Routing Algorithms • High Performance Computing • Database Security and Privacy
- Software Defined Networks • Semantic Web • Wireless and Mobile Communication • Service Oriented Architecture • Network Design and Management

B.Tech.

CSE (Specialization in Artificial Intelligence and Machine Learning)

The importance of Artificial Intelligence and Machine Learning has been increasing as a growing number of companies are using these technologies to improve their products and services, evaluate their business models, and enhance their decision-making process.

Elective Courses

- Genetic algorithm and its Applications • Artificial Neural Networks • Fuzzy Logic and its Applications • Computer Vision • Digital Image Processing • Natural Language Processing
- Statistical Machine Learning • Nature Inspired Computing Techniques • Applied Machine Learning • Computational Neuroscience • Intelligent Machining • Deep Learning • Robotics: Computational Motion Planning • Advanced Algorithms

B.Tech.

CSE (Specialization in Big Data Analytics)

Big Data allows organizations to detect trends, and spot patterns that can be used for future benefit. It can help identify customers who are likely to buy products, and optimize marketing campaigns by identifying advertisement strategies which give the highest return on investment.

Elective Courses

- Big Data Tools and Techniques • Data Mining and Analytics • Machine Learning - I • Information Storage and Management • Text Mining • Business Intelligence and Analytics • Web Intelligence • Data Science • Database Security and Privacy • Data Warehousing and its Applications • Functional Programming • alytics • Big Data Visualization • Deep Learning • Machine Learning II

B.Tech.

CSE (Specialization in Block Chain)

Block chain is a technology that enables moving assets from one individual to another. With many practical applications for the technology already being implemented and explored, a degree programme specialising in blockchain will open up new avenues for the young engineers

Elective Courses

- Number theory and Statistics • Cryptography (Existing course) • Distributed systems& Applications
 - Distributed Ledger Technology • Big Data Tools and Techniques (Existing course)
 - Basics of Blockchain and Cryptocurrency • Smart contracts using solidity • Trust based computing • Web3 development • Introduction to Banking • Introduction to supply chain and logistics
-

B.Tech.

CSE (Specialization in Cyber Security)

Cyber Security programmes teach you how to protect computer operating systems, networks, and data from cyber-attacks, and also how to monitor systems and mitigate threats when they happen.

Elective Courses

- Cryptography • Forensics And Incident Response • Network Security • Information Assurance and Security
 - Secure Software Development Life Cycle • Security Audit and Risk Assessment
 - Penetration Testing and Vulnerability Assessment • Biometrics • Malware Analysis • Cloud Security • Cyber Law • Mobile and Wireless Security • Database Security • Security Governance, Risk and compliance • Operation System Security
-

B.Tech.

CSE (Specialization in Cloud Computing)

Specialisation in cloud computing helps to understand how concepts like IaaS, SaaS and PaaS are applied in various fields. Students learn the core fundamentals of hardware necessary for implementing cloud computing.

Elective Courses

- Communication Systems Engineering • Digital Communication Systems • Principles of Cloud Computing • Distributed Operating Systems • Data Centric Networks • Web Application Development • Cloud Architecture • Wireless Sensor Networks • High Performance Computing
 - Software Defined Networks • Network Design and Management • Cloud Application Development • Cloud Security • Big Data Essentials • Cloud Strategy Planning and Management
-

B.Tech.

CSE (Specialization in Computer Networking)

This curriculum aims to boost the problem-solving and research skills of students.

Elective Courses

- Distributed Computing • Distributed Operating Systems • Optical Networks • Data Centric Networks • Principles of Cloud Computing • Internet of Things • Pervasive Computing • Wireless Sensor Networks • Network Protocols and Programming • Network Routing Algorithms • High Performance Computing • Software Defined Networks • Wireless and Mobile Communication
- Network Design and Management • Service Oriented Architecture

B.Tech.

CSE (Specialisation in Gaming)

India being one of the top five countries for mobile gaming in the world, the digital gaming industry is growing rapidly. The industry is already worth over \$890 million. And with the demand for games on an upward curve, the country now has more than 250 game development companies, with at least two startups coming up every month. This degree programme will provide the necessary foundation knowledge as well as expertise in the development of mobile gaming.

Elective Courses

- Video game development • User interface principles • Game Engine Development • Graphics and Rendering • Design Thinking for Game Development • Responsive Mobile Platform • Mobile Application Development • Augmented & Virtual Reality Development • GPU Programming |Game Prototyping • Computer Animation and Simulation • Machine Learning • Interface Design for Games • Advanced Visual Design for Games • Usability Testing for Games • Game Design for Business • Critical Theory and Analysis of Games

B.Tech.

CSE (Specialisation in Information Technology)

They benefit businesses by allowing companies to work more efficiently and maximise productivity through application of communication and web technology.

Elective Courses

- Data Centric Networks • IOT Architecture and Protocols • Machine Learning-I • Artificial Neural Networks • Network Programming • Wireless Sensor Networks • Software Defined Networks • IOT Security • Wireless and Mobile Communication • Advanced Database Systems • Edge Computing • Energy Management for IOT devices • Big Data Visualization

B.Tech.

CSE (Specialization in Internet of Things)

IOT teaches you to use affordable wireless technology and transmit data to the cloud at a component level and also provides a place to save data, besides facilitating management and security.

Elective Courses

- Web Programming • Integrative Programming and Technology • System Administration and Maintenance • Fundamentals of Virtualization • Information Storage and Management • Human Computer Interaction • Computational Data Analysis • Network Protocols and Programming • Wireless Sensor Networks • Internet Security and Cyber Forensics • Data Centre Administration and Management • IT Service Management and Operations • Computer Graphics and Game programming • Computational Media

B.Tech.

CSE (Specialisation in Software Engineering)

The prime focus of the Software Engineering is to enhance the students' knowledge, extending and strengthening their ability to develop and sustain the transformative system of tomorrow. Software Engineering applies the knowledge gained through computer science to build secure computer software, whether for incorporating into products, for manufacturing products or for designing competitive products.

Elective Courses

- Requirements Engineering • Software Architecture and Design • Software Modelling and Analysis • Design Patterns • User Interface Design • Visual Programming • Programming in Java Script • Software Engineering Tools • Service Oriented Architecture • Software Verification and Validation • Software Quality Assurance • Software Measurements and Metrics • Software Process and Agile Practices • Software Security • Software Maintenance and Administration

B.Tech.

Computer Systems & Business Systems in collaboration with TCS

This curriculum aims to ensure that the students graduating from the programme not only know the core topics of Computer Science Engineering but also develop an equal appreciation of humanities, management sciences and human values.

M.Tech.

Computer Science & Engineering

M.Tech in Computer Science and Engineering is a two-year post-graduate programme designed for engineers working in various fields to enhance their knowledge and skills with latest technology developments in Computer Science and Information Technology and related fields. This course offers advanced knowledge of core fundaments in Data Structures and Algorithms, Computer networking, Database systems, Computer System Architecture, Software Engineering and a wide range of optional subjects involving latest technologies and tools. One full semester is set apart for doing quality project work, with research focus. This enhances students' knowledge and also makes them job-focussed.

Core Subjects

- Data Structures and Algorithms • Parallel Computer Architecture • Object Oriented Software Engineering • Data Base Technology • Computer Networks and Management • System Programming

Elective Courses

- Component Based System Design • Bio Inspired Computing • Distributed Operating Systems
- Digital Image Processing • Human Computer Interaction • Wireless Networks • TCP / IP Technology • Pattern Recognition Techniques • Data Warehousing and its Applications
- Network Security & Cryptography • Grid Computing • Natural Language Understanding • Data Mining Concepts and Techniques • Wireless Sensor Networks and Programming • Server Oriented Architecture • Cloud Computing • Trusted Computing

Supportive Courses

- Mathematical Foundations of Computer Science • Graph Theory and Optimization Techniques
 - Stochastic Processes and Queueing Theory
-

M.Tech.

Cloud Computing

Cloud Computing is an advanced specialization of Computing Science and Engineering. M.Tech in Cloud Computing is a two-year postgraduate programme designed in collaboration with Virtusa to enlighten the students in this advanced field of Cloud and related areas which are industry-focused. This course offers advanced knowledge of core fundaments in Cloud Architectures, Cloud storage, Data center networks, Cloud security, and a wide range of optional subjects involving latest technologies and tools like Cloud application development, Data warehousing and mining, Converged networks, Enterprise storage systems, Data centre virtualization, etc. The curriculum includes Industry-supportive elective courses and Industry-supportive certification courses, which are unique to this programme driven by industry experts. A project for a full semester enables students to study the adoption of latest technologies and tools in the industries to develop useful systems for specific applications.

Objectives

1. Students will have the ability to adapt, contribute and innovate new technologies and systems in the key domains of Cloud computing

2. Students will be able to perform in technical/managerial roles ranging from design, development, problem solving to production support in software industries and R&D sectors in Cloud platform.
3. Students will be able to successfully pursue higher education in reputed institutions.

Core Subjects

- Cloud Architectures • Cloud Storage Infrastructures • Cloud Security • Data Center Networking
- Managing Virtual Environments • Web Application Development

Elective Courses

- Design & Development of Cloud Applications • Application Development Frameworks
- Scripting for System Administrators • Data Warehousing and Mining • Converged Networks
- Network Security • Enterprise Storage Systems • Object Oriented Software Engineering • Data Center Virtualization • Cloud Application Development • Cloud Strategy Planning & Management
- Data Science & Big Data Analytics

Supportive Course

- Data Analysis using Multivariate Techniques and Forecasting Methods

M.Tech. Internet of Things

M.Tech in Internet of Things is a two-year post-graduate programme designed for engineers working in the field of Sensors, Networks and Internet oriented domains. It provides a great opportunity for students to experience these upcoming technology developments in IoT, as well as use those tools and techniques required for developing applications. This course offers advanced knowledge of core fundaments in Wireless Sensor Protocols, Programming, Embedded system design, Real time Operating systems, IoT Architecture and Protocols, Cloud architectureand computing, and a wide range of optional subjects involving latest technologies and tools like Privacy and security in IoT, Smart convergent technologies, RFID and controllers, Fog Computing, SDN and NFV for IoT etc. One full semester is devoted to projects, which gives students enough time to explore technology developments and come out with a quality project focusing on research or developing specific applications. As IoT is the future which touches all walks of human life, there is great opportunity for students to excel in their careers. It also opens up a wide spectrum of problems and issues where research is needed.

Core Subjects

- Wireless Sensor Protocols and Programming • Computer Networks and Management
- Embedded System Design and Architecture • Career Advancement Course for Engineers
- Embedded Systems and Real Time Operating System • IoT Architecture and Protocols • Cloud Architecture and Computing • Career Advancement Course for Engineers

Elective Courses

- Cooperative Communication Systems • Big Data Analytics for IoT • Privacy and Security in IoT
- Internet of Things: Sensing and Actuator Devices • Smart Convergent Technologies • RFID and Microcontrollers • Fog Computing • Wearable Computing, Mixed Reality and Internet of Everything • Programming and Interfacing with Microcontrollers • SDN and NFV for IOT
- Advanced Distributed Systems • Software Architecture and Interoperability • Energy Harvesting Technologies and Power • Management for IoT Devices • Cloud Storage and Computing • Kernel and Driver Programming • Design And Testing Of Digital Systems
- Embedded Control Systems

Supportive Courses

- Mathematical Foundations of Computer Science • Graph Theory and Optimization Techniques
- Stochastic Processes and Queueing Theory

DEPARTMENT OF INFORMATION TECHNOLOGY



Undergraduate Programme

- B.Tech. Information Technology

Postgraduate Programmes

- M.Tech. Big Data Analytics
- M.Tech. Cloud Computing
- M.Tech. Information Security & Cyber Forensics

The Department of Information Technology was started in the year 1998 with a B.Tech. IT programme. At present, the Department has over 2500 students and experienced full-time faculty, in addition to distinguished visiting professionals from industry and academia. The Department helps the students to enhance their IT skills in research & development through a balance in theory and practice. The Department emphasizes Domain Specific Applications such as Networks, Information Security, Software Engineering, Operating Systems, Database Management Systems, Image Processing, Cloud Computing etc. to facilitate the students in acquiring greater knowledge, global competency and excellence, for the betterment of the society. With the evolution of technologies like Artificial Intelligence, Machine Learning, Robotics and IoT, the scope of Information Technology has grown in leaps and bounds. The Department of IT has been completely redefined with the inclusion of emerging technologies. Over the years, the courses have evolved to meet industry expectations, and students are able to learn new technologies, tools and platforms that ensure that they sail smoothly into the professional environment.

Accreditation

B.Tech Information Technology (IT) programme at the SRMIST Kattankulathur Campus is accredited by Computing Accreditation Commission of ABET, USA (<http://www.abet.org>)

Facilities

Private cloud infrastructure and 60% of the labs are virtualized, to have flexibility and efficient utilization of available systems. A state-of-the-art, "Data Analytics lab" was set-up in collaboration with EMC to carry out projects and research on Big Data.

The department has to its credit 14 laboratories (Open Source Technologies, Cyber Forensics, Networking, Database, Visual Programming, Embedded Systems lab, CISCO Network Academy etc), and a total of over 500 systems.

Research

IT Department Faculty Publications include publications in indexed journals like SCOPUS, Web of Science (WoS) and Science Citation Index (SCI). There has been a gradual increase in the quality of publications since 2017.

Collaborations:

NEC-Japan, Society of Electronic Transactions and Security (SETS), EMC2 through academic alliance program, Dell, Microsoft, CISCO, TCS, Symantec, Mahindra Satyam, IBM and ORACLE

Semester Abroad:

Semester Abroad Program (SAP) is a unique opportunity offered to students to take up a semester in universities abroad. It also gives them easy access to international expertise and research collaboration. This also gives them deep experience at the cultural and social levels apart from enhancing their technical skills set. Over the past three years, 14 students have embraced this unique opportunity and reaped its benefits.

Career Prospects

As an occupational field, information technology is projected to be one of the fastest growing in the nation, collectively producing 18 percent additional job openings nationally between 2012 and 2022. The wide spectrum of career options available to graduates from the Department of IT graduates ranges from private placements to positions in the field of research.

B.Tech. Information Technology

The B.Tech. IT course aims to shape engineering practitioners and leaders who help solve technological problems, innovators or entrepreneurs engaged in technology development, technology deployment, or implementation of engineering systems. We also aim to equip our graduates to pursue higher studies in engineering.

Core Courses

- IT Fundamentals • Program Design and Development • Unix and C Lab • Electronic Devices and Circuits • Digital Electronics • Computer Architecture • Object Oriented Analysis and Design
- Electronic Devices and Circuits Lab • Object Oriented Programming Lab • Principles of Communication Systems • Microprocessor and Interfacing • Programming in Java • Data Structures and Algorithms • Microprocessor and Interfacing Lab • Data Structures and Algorithms Lab • Software Engineering • Database Systems • Computer Networks • Operating Systems • Visual programming • RDBMS Lab • Operating Systems Lab • Wireless and Mobile communication • Embedded Systems • Web Systems and Technology • E - Commerce
- Embedded Systems Lab • Web Technology Lab • Professional Ethics • Principles of Management • TCP/IP Technology • Integrative Programming and Technologies • Networking Lab • Integrative Programming and Technologies Lab • Advanced Java Programming

Elective Courses

- Cryptography • Distributed Systems • Multimedia Systems Development • Multimedia Information Systems • Artificial Intelligence • System Programming • Biometrics • Data Compression • Human Computer Interaction • Data Warehousing • Principles of Compiler Design
- Information Assurance and Security • Network Security • Multimedia Networks • Data Mining
- Neural Networks • UNIX Internals • Forensics and Incident Response • Multimedia Tools and Applications • Knowledge Management • Robotics • Parallel Computer Architecture • Secure Coding Principles • Grid Computing • Game Programming

M.Tech. Big Data Analytics

The Department of Information Technology of SRMIST, offers a PG course, "Big Data Analytics" from 2015 onwards. The PG program in Big Data Analytics, with our carefully crafted curriculum, is designed to endow the students with deep knowledge about big data. The department has academic collaboration with various corporate companies, start-ups and foreign universities for the benefit of students to carry out research / internships / project work.

Most of the students were placed in specialized companies for data analytics like - Agillium, AlphaCloud Labs, SAP Labs, Informatica.

Infrastructure related to Big Data Analytics: The big data analytics lab is equipped with state-of-the-art open source technologies like R, Apache Spark, Flink, Storm, Zookeeper, Kafka, ZeroMQ, D3JS etc. which supports the whole life cycle of big data processing and development in languages like Scala, Go and Python. The existing private cloud infrastructure is used to deploy and test applications. The above big data frameworks are configured on distributed real time physical clusters as well for better comprehension of service co-ordination practically.

Core Courses

- Foundations of Data Science • Big Data Technology • Computing for Data Analytics
- Programming for Data Analytics • Marketing Analytics • Algorithms for Advanced Analytics

Elective Courses

- Python Programming for Data Analytics • Decision Management Systems • Big Data Security
- Risk Analytics • Information Storage Management • Cloud Computing • Cluster Computing
- Functional Programming • Web Intelligence and Big Data Analytics • Social Network Analytics
- Streaming Analytics • Advanced Algorithms • Natural Language Processing • Pattern Recognition • Deep Learning

M.Tech. Information Security & Cyber Forensics

The Department of Information Technology has been offering a PG course, Information Security and Cyber Forensics (ISCF), from 2008 onwards. It has established academic collaboration with various corporate giants and foreign universities to help students to carry out research / internships / project work. Till date, 2500+ students have undergone cyber security- related courses and most of them were placed with security giants like Symantec, Infosys Security, TCS Security, SETS (Society for Electronic Transaction Security). A few have become Entrepreneurs.

International Certification Support: SRMIST is the Academic Partner of EC-Council, USA. Through this Academic alliance, SRMIST students will have the benefit of using iLabs, iLearn, CyberQ, and training to complete International Certifications.

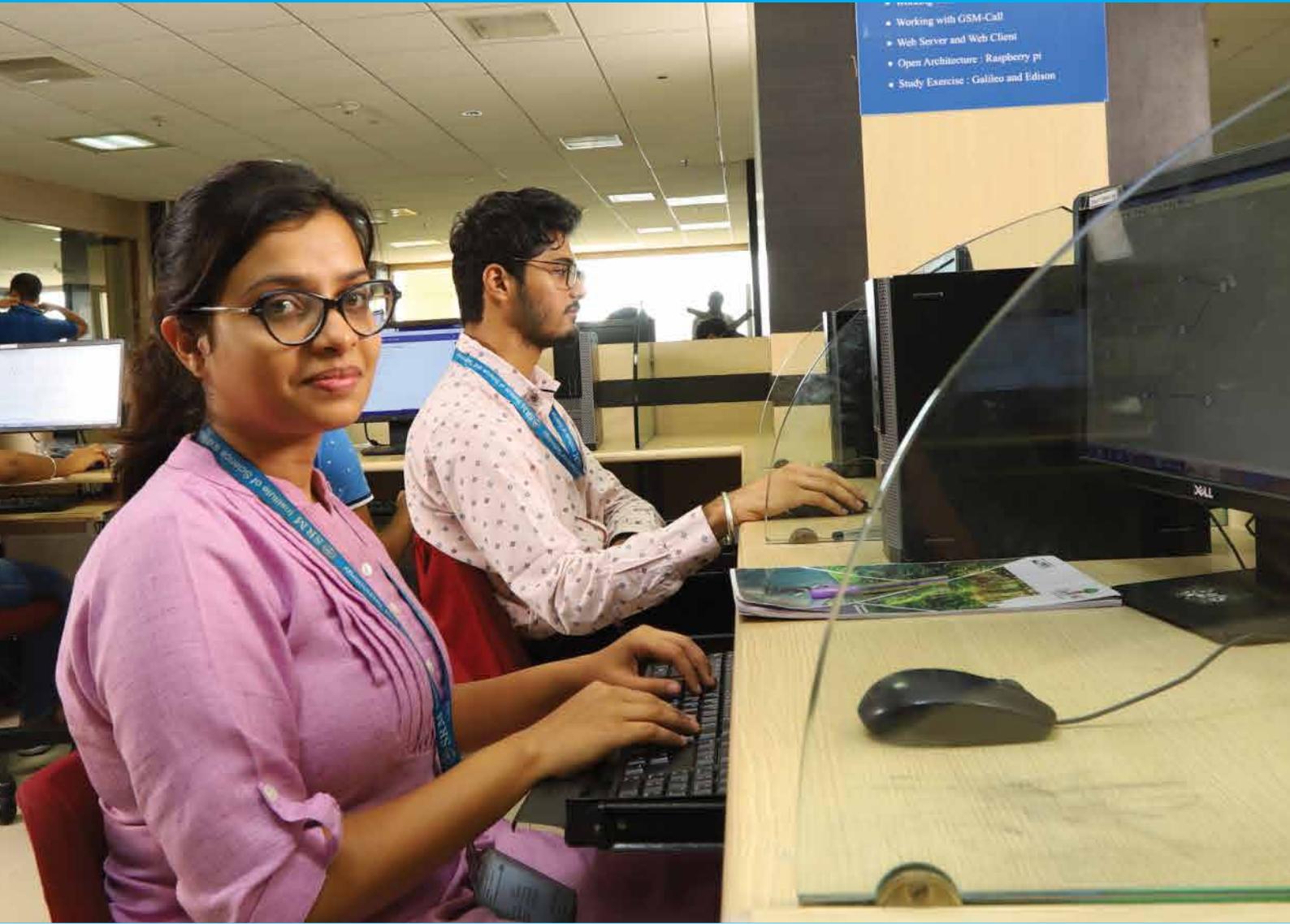
Core Courses

- Introduction to Cryptography • Security Scripting and Analysis • Operating Systems Administration and Security • Network Security • TCP / IP • Forensics and Incident Response

Elective Courses

- Applied Cryptology • Principles of Secure Coding • Mobile and Digital Forensics • Mobile and Wireless Security • Malware Analysis • Penetration Testing and Vulnerability Assessment
- Computer and Information Security Management • Risk Assessment and Security Audit
- Storage Management and Security • Cloud Architectures and Security • Cyber Law • Android Security Design and Internals

DEPARTMENT OF SOFTWARE ENGINEERING



Undergraduate Programme

- B. Tech. Software Engineering

Software is important for our economy, security and quality of life. Much of the economy depends upon highly secure computer software, whether for incorporating into products, for manufacturing products or for designing competitive products. The prime focus of the Software Engineering Department is on enhancing the students' knowledge and extending and strengthening their ability to develop and sustain the transformative system of tomorrow. The Department offers a comprehensive undergraduate course curriculum that prepares students to be leaders in software engineering. It started offering UG courses from 2008 and emerged as a separate department in 2012. From 2018 onward the course being offered is Computer Science Engineering with Specialization in Software Engineering. Well-qualified and experienced faculty members form the backbone of the Department. There are 38 faculty members, with 14 of them holding Doctorate Degrees and 24 pursuing Doctoral Programmes. The Department has always strived to maintain a long-term relationship with leading industries to enhance the curriculum, and offer a wide variety of events, internships and projects with Industry collaboration, preparing students to be job ready.

The Department has four main labs, namely: 1. Programming Languages Laboratory 2. Computing Technologies Laboratory 3. Software Quality Laboratory 4. Software Development Laboratory.

Accreditation IET:

B.Tech Software Engineering program at the SRMIST Kattankulathur Campus is accredited by The Institute of Engineering and Technology (IET), UK (<https://www.theiet.org/>)

The software used includes:

- Code Blocks 16.01, Eclipse Luna 4.4, • Net beans 8.0.2, MS office 2007 & 2013
 - Python 3.4.3, 3.6 • R Programming (R i386 3.1.2) • Oracle 11g\SQL Developer
 - NS2- 2.29.2 • MATLAB 2016B, HADOOP, Oracle 11g\SQL Developer, WEKA 3.8.1
 - Ubuntu14 - 64bit • Hadoop 2.6, Maven 3.0.5 • Mongo DB v2.4.9 • Postgre SQL - Client 9.3.9 • Selenium IDE 2.4 • GIT 1.9.1 • STS - Spring Tool Suite 2.8 • Open SSH • Jdk1.8
 - SCILAB 6.0.0-beta 1 • Xampp • Latex
-

Research

The Department provides R&D facilities to both faculty and students in domains such as Software Engineering Process, Computer Vision, Network System & Services and Computing Technologies. The faculty, research scholars and students have successfully published over 270 papers in indexed journals like SCOPUS indexed, Web of Science (WoS) indexed and Science Citation Index (SCI) in the past three years. In addition the faculty have also filed 10 patents out of which 9 have been successfully published in the year 2018-2019.

Research facilities include

1. Big Data Analytics Research Centre
2. IoT Research Centre

Centre of Excellence

Data Research Associates academic alliance program with the aim of generating a competitive, experienced workforce and enhancing global software safety and security expertise in India.

Ongoing research projects include::

1. AAutomatic Device for Blood and Serum Analysis for DST
2. “Livelihood Enhancement of Rural women” in Kanchipuram District
3. Application of Deep Learning to predict Wind Energy for National Institute of Wind Energy
4. Human Character Analysis using Iris images
5. Smart Parking
6. Automatic Detection of Driver Drowsiness using Deep Learning

The B. Tech Software Engineering Programme has broad career prospects and higher education opportunities.

Collaborations have been established with industries like LDRA Bangalore and leading Companies like Amazon, TCS, Capgemini, Wipro, Mahindra and Mahindra, Freshworks and many more.

Semester Abroad Program:

The students of Software Engineering have pursued a semester abroad with partnering institutions like

- University of California, Davis • Massachusetts Institute of Technology • Efrei (France) • Teesside University, UK • Furtwangen University, Germany

Career Prospects

The various career trends applicable to software engineering include Full Stack Developer, UI Designer, Mixed Reality, Artificial Intelligence, IOT, Blockchain, Language Trends, Code Quality, Quality Assurance etc. Constantly maintaining an average placement record of over 90%, our students have secured jobs as Software Engineers, Front End Engineers, Business Technology Analysts, Graduate Engineer Trainees, Business Analysts, System Engineer Specialist, IT Operations Analysts and Full Stack Developers.

In 2019-20, 97 percent of the students were placed. Dream offers came from Udaan, Amazon, ZS Associates, TCS Digital, Musigma, Rippling, VMWare, CISCO and Nielsen, starting from Rs. 10 LPA to Rs. 32 LPA.

B.Tech. Software Engineering

Graduates will able to

- Perform in technical/managerial roles ranging from design, development and problem solving to production support in software industries and R&D sectors.
- Pursue higher education in reputed institutions
- Develop multidisciplinary skills, equipping them for comprehensive leadership in their specialized domains.



- Adapt, contribute and innovate new technologies and systems in the key domains of Computer Science and Engineering
- Provide ethically and socially responsible solutions in Computer Science and other engineering disciplines
- Meet the demands and challenges of the growing software industry
- Acquire a comprehensive set of skills

Core Courses

- Data Structures and Algorithm • Object Oriented Design and Programming • Computer Organization and Architecture • Design and Analysis of Algorithms • Operating Systems • Software Engineering and Project Management • Advance Programming Practice • Formal Language and Automata • Computer Networks • Database Management Systems • Compiler Design • Artificial Intelligence • Comprehension

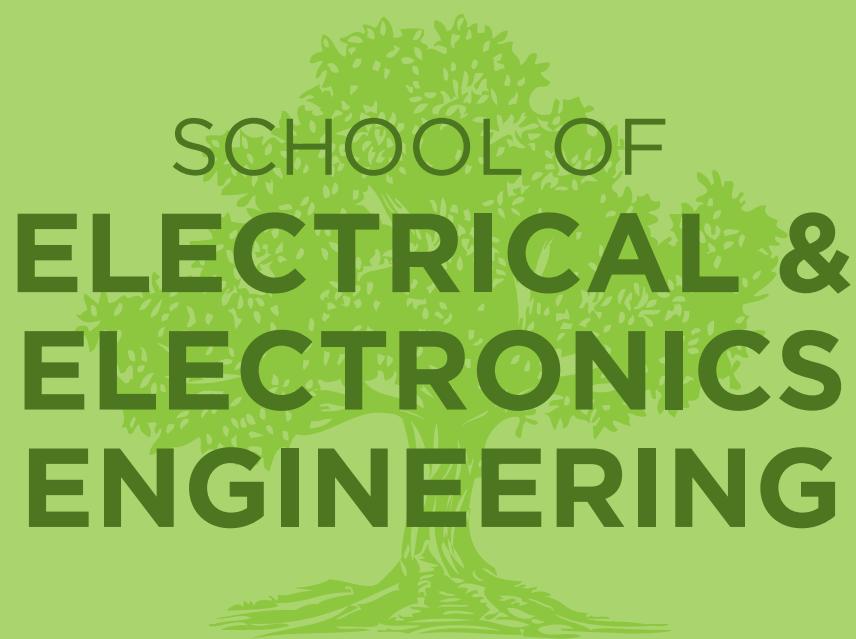
Elective Courses

- Requirements Engineering • Software Architecture and Design • Software Modelling and Analysis • Design Patterns • User Interface Design • Visual Programming • Programming in Java Script • Software Engineering Tools • Service Oriented Architecture • Software Verification and Validation • Software Quality Assurance • Software Measurements and Metrics • Software Process and Agile Practices • Software Security • Software Maintenance and Administration

Other courses include:

1. Basic Sciences (Semiconductor Physics, Chemistry, Calculus and Linear algebra, Advanced Calculus and Complex Analysis, Transforms and Boundary Value Problems, Probability and queuing Theory, Discrete Mathematics and Biology)
2. Engineering Science Courses (Engineering Graphics and Design, Basic Electrical and Electronics, Civil and Mechanical Engineering Workshop, Programming for Problem Solving, Analog and Digital Electronics, Computer Communications)
3. Mandatory courses: Professional skills and Practices, Competencies in Social Skills, Entrepreneurial Skill Development, Critical and Creative Thinking Skills, Business Basics, Analytical and Logic thinking skills, Entrepreneurship management, Constitution of India, Value Education, Physical and Mental Health using Yoga, NSS, NCC, NSO, Indian Traditional Knowledge, Indian Art Form and Environmental Science
4. The students have to do a Major Project, Internships, Industrial Training / Moocs / Seminar





- DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
- DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
- DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING



Undergraduate Programmes

- B.Tech. Electrical & Electronics Engineering
- B.Tech. Electrical & Computer Engineering

Postgraduate Programmes

- M.Tech Power Electronics & Drives
- M.Tech. Power Systems

The Electrical and Electronics Engineering Department is one of the pioneering departments in the SRM Institute of Science and Technology. It was established in 1992 as a key entity under the University of Madras before SRM became a deemed university in 2003-04. The Department currently offers two UG programmes, two PG programmes and Ph.D research programmes. It has qualified and experienced faculty members, with Ph.D and post-doctoral qualifications. Faculty members are consistently involved in research leading to publication of papers in reputed journals like IEEE, IET, etc. and filing patents to convert ideas into products by applying cutting-edge technologies. Industrial experts come in as adjunct professors/visiting professors to handle a course for an entire semester.

Accreditations

The B.Tech. Electrical and Electronics Engineering programme at Kattankulathur, Chennai, is accredited by Engineering Accreditation Commission of ABET. (<http://www.abet.org>).

The Department received an AICTE-CII Award for the Best Industry-linked Institute for Electrical Engineering and allied branches for the year 2019.

Facilities

Laboratories

There are eight laboratories for UG students and three laboratories exclusively for PG students and research scholars.

- Electrical Workshop Practice Lab • Electrical Machines Lab • Electronics Lab
- Simulation Lab • Renewable Energy Research Lab • Microprocessor and Microcontroller Lab • Measurements and Control system Lab • Power Electronics Lab
- Special Machines and Drives Lab • Research Lab • Power Converter Lab • Unique Research Software Facilities • ETAP • Magnet • MULTISIM • PSIM • MATLAB • PSCAD
- DIgSILENT PowerFactory • Power World Simulator • Mi-Power • D SPACE • Lab View • System Generator • Hardware in the Loop Simulator
- Harmonic analyzer

Training facilities

The major training facilities are:

- Solar PV Emulator and Simulator • HIL Simulation Using dSPACE / Labview
- Machine modelling analysis using Finite Element Analysis
- Power system studies using DIgSILENT / Power World Simulator • Performance analysis of Electrical Machines using Open sys lab • Energy / thermal audit using PQ analyzer.

Research

The major thrust areas of research include:

- Power System Stability studies • Power System Deregulation • Power Electronic Converters for renewable Energy Systems.
- Feeder Reconfiguration and Relay Co-ordination • Power Quality Monitoring and Conditioning • Fault Classification in Electrical Machines • Modelling and Design of Electrical Machines • Smart Grid and Microgrid • Plug-in Hybrid Electric Vehicle
- Wireless Power Transmission • MEMS • Renewable Energy Systems and its integration to Grid

Funded Projects

Funding has been sanctioned for five projects.

- The Department regularly holds national / international level conferences, seminars and workshops
- EEE Department interacts and liaises with reputed industries to facilitate funded projects, research and consultancy in chosen areas. The Department's Corporate Advisory Board/ Board of Studies includes top executives from leading industries and Government organisations such as State Electricity Board, Larsen & Toubro, Siemens, Schneider Electric Ltd., ABB, Bharat Heavy Electricals Ltd., Atomic Research Centre, etc.
- Under the Semester Abroad Program (SAP), every semester, students have been sent to various universities like Massachusetts Institute of Technology-USA, University of Wisconsin-USA, Lille Catholic University-France and Technical University Chemnitz-Germany, Saxion University, Netherlands, National University of Singapore and University of California-Davis.
- The Department is collaborating with NEC-Japan on a series of projects in the area of microcontrollers.
- The Department has three active Student chapters: Marine Technology Society, Institution of Engineers and ENFUSE.
- The following scholarships are given to one student each of the department through the SRM MTS Chapter
 - MTS Vembu Subramaniam Scholarship (INR 1,25,000)
 - MTS Undergraduate Scholarship (USD 3000)
- Twenty-six patents have been filed by students and faculty in the last two years.
- Every semester two faculty members undertake internship through Faculty Industry Immersion Program (FIIP), in the following Industries: Bharathiya Nabhiya Vidyut Nigam Ltd., National Institute of Wind Energy, Tamil Nadu Cement Corporation Ltd., National Instruments, EDAC Engineering Ltd, National Institute of Ocean Technology, etc.
- Every year 20% of our students go abroad for higher studies.

Career Prospects

Students choosing the B.Tech. in Electrical and Electronics Engineering programme have multiple options for careers in core electrical electronics and IT sectors. They work in diverse fields such as: Power Sector, R & D, Software and IT, etc. The opportunities are not just limited to the private sector but extend to the government sector and Entrepreneurship. There is huge demand for qualified engineers in core electrical engineering fields such as consumer electronics, smart grid, electric vehicles, IoT, etc.

Students choosing B.Tech in Electrical and Computer Engineering programme have multiple options for careers in the IT and power sector Industry.

They can work in diverse fields as Software Engineers, Systems Engineers, System Analysts, Business Analysts, Systems Administrators, Project Managers, Network

Engineers, Software Consultants, Electrical Maintenance Engineers, Safety Engineers, Sub-station-In-charge, Applications Developers, etc.

The opportunities are not just related to the IT sector but extend to the public sector as well as start-ups.

There is a huge demand for qualified engineers to develop software and hardware for core electrical engineering fields by applying Artificial Intelligence and Machine Learning, IoT, Big Data, etc.

B.Tech. Electrical & Electronics Engineering

Electrical Engineering is about innovation and using cutting edge technologies to provide solutions to society's needs like sustainable green and clean energy, e-mobility etc. Electrical Engineering is a combination of mathematics and science. The EEE programme produces industry-ready engineers in three domains: Electrical, Electronics and IT sector.

Core Courses

- Analysis of Electric Circuits • Electromagnetic Theory • Electrical Machines • Analog and Digital Electronics • Electrical and Electronics Measurements and Instrumentation • Generation, Transmission and Distribution • Control Systems • Power Electronics and Drives • Power System Analysis • Microcontrollers • Power System Protection • Power System Operation and Control

Elective Courses

The Department offers electives in six major streams:

Sub-Stream: Machines and Drive: • Optimization Techniques in Power Electronics • Finite Element Analysis for Electrical Machines • Power Converter Analysis and Design • Switched Mode Power Conversion • Design of Electrical Machines • Special Electrical Machines • Solid State Drives • Modelling and Analysis of Electrical Machines • Hybrid Electric Vehicles • Sustainable Energy Sources

Sub-Stream: Sustainable Energy Resources: • Solar Photovoltaic System • Energy Management System and SCADA • Distributed Energy Resources • Distributed Generation and Micro grid • Power Electronics in Renewable Energy • Wind and Solar Energy System

Sub-Stream: Power System: • Energy Conservation & auditing • Industrial Power System • FACTS • High Voltage Engineering • Power Quality • Smart Grid • Vehicular Power System • Power System Harmonics • HVDC and EHVAC Systems • Power System Dynamics • Modern Power System Analysis • Power System Deregulation

Sub-Stream: Control systems and Robotics: • System Theory • Robust Control System • Fundamentals of Robotics • Signals & Systems • Advance Control Theory • Distributed Control Systems • Control System Design • Digital Control System • Electronics

Sub-stream: Electronics: • Photonics • Principles of Biomedical Instrumentation • Automotive Electronics • Analog and digital Communication • Wavelet Transform • Advanced CMOS Devices & Technology • Sensors & Transducers • Medical Electronics • Advanced Semiconductor Devices • Mobile Communication • Satellite Communication • Embedded System • VLSI Design

Sub-stream: AI-based Techniques: • Data Structures • Computer System Architecture • Computer Networking • Internet of Things • Principles of Object-Oriented Programming • Modern Optimization Technique • Neuro Fuzzy and Genetics Programming • Artificial Intelligence • Fundamentals of Big Data Analytics • Fundamentals of Cloud Computing

B.Tech. Electrical & Computer Engineering

B.Tech (Electrical & Computer Engineering) is a unique programme designed to cater to the need for engineers with combined hardware and software skills. Such a programme is popular abroad, but only a very few Indian universities offer it. Graduates from this stream have a lot of scope for pursuing higher studies abroad. They can also find employment as Software Engineers, Systems Engineers, System Analysts, Business Analysts, Systems Administrators, Project Managers, Network Engineers, Software Consultants, Applications Developers, etc.

Core Subjects:

- Analysis of Electric Circuits • Electromagnetic Theory • Programming Basics • Electronics I
- Electrical Machines • Electronics II • Advanced Programming Structures • Power Systems I
- Control Systems • Data Structures Algorithms and Design • Power Systems II • Embedded System Design • Database Design Architecture and Management • Real Time Operating Systems

Elective Courses

The Department offers electives in two major domains – Electrical and Computer Engineering. The students have the flexibility in choosing the electives either in any one of the domain. Electrical domain elective subjects include all the sub-streams available in Electrical and Electronics Engineering Program. Computer domain electives are listed below.

Domain: Computer Engineering

- Internet of Things • Network Routing Algorithms • Database Security and Privacy • Software Engineering • Compiler Design • Digital Image Processing • Wireless Sensor Networks • Artificial Intelligence • Pattern Recognition Techniques • Data Mining and Analytics • Cloud Architecture
- Business Intelligence and Analytics • Wireless and Mobile Computing • Machine Learning
- Cyber Security

M.Tech. Power Electronics & Drives

The postgraduate course on power electronics will provide a strong foundation for careers in electrical engineering, power conversion and control systems. The objective of this course is to focus on the fundamental principles of power electronics and its applications. This includes power electronics circuits, power semiconductor devices and converter topologies. Students will learn advanced analysis and design techniques for switch-mode converters using the buck, boost, and buck-boost topologies. The curriculum structure and the research lab facilities in the Department provide students the knowledge base and practical expertise to meet the challenges of the industry.

Core Courses

- Analysis of Power Converters • Analysis of Inverters • Solid State DC Drives • Solid State AC Drives • Advanced Electrical Drives • Power Electronics in Renewable Energy Systems • Industrial Training

Elective Courses

- Modeling of Electrical Machines • Digital Controllers for Power Electronic Applications • Flexible AC Transmission Systems • Intelligent Controllers • High Voltage DC Transmission • Power Quality • Digital Signal Processing • Design of Controllers in Power Applications • Distributed Control Systems • MEMS • Advanced Power Semiconductor Devices • Special Machines and their Controllers • Optimization techniques in Power Electronics • Software tool for Power Electronic Applications • Smart Grid Design and Analysis



M.Tech. Power Systems

M.Tech Power Systems is a 2-year full-time post graduation programme, dealing with mathematical models of various components used in power systems, different methods of power flow solutions, analysis of effects of different types of faults, effect of stability problems and their solutions and frequency and voltage control techniques. The objective of this course is to provide in-depth knowledge about the power system network and the advanced computing techniques applied to electrical networks. It enables students to understand the real time problems in generation, transmission and distribution of electrical power. The course is structured in such a manner as to inspire students to pursue Ph.D degrees.

Core Subjects:

- Modern Power System Analysis • Power System Operation and Control • Power System Protection • Power System Dynamics • Flexible AC Transmission Systems • Deregulation of Power System

Elective Courses

- High Voltage Direct Current Transmission System • Power Distribution Systems • Electrical Transients in Power Systems • Smart Grid Design and Analysis • Modern Optimization Techniques in Power Systems • Power System State Estimation • Advanced Power System Dynamics • Wind and Solar Energy Systems • Power quality • Industrial Power System Analysis and Design • Power System Planning and Reliability • Energy Management and Auditing • Distributed Generation and Micro Grid • Design of Controllers in Power Application • Analysis of Electrical Machines • Special Machines and their Controllers • System Theory • Artificial Neural Networks Applied to Power Systems • Digital Signal Processing • Intelligent Controllers

DEPARTMENT OF ELECTRONICS & COMMUNICATIONS ENGINEERING



Undergraduate Programmes

- B.Tech. Electronics and Communication Engineering
- B.Tech. ECE with specialization in Biomedical Engineering offered till 2019
- B.Tech. ECE with specialization in Cyber Physical Systems
- B.Tech. Electronics and Computer Engineering
- B.Tech. ECE with specialization in Data Sciences
- B.Tech. ECE with specialization in Instrumentation Engineering offered till 2019

Postgraduate Programmes

- M.Tech. Embedded Systems Technology
- M.Tech. Telecommunication Networks
- M.Tech. VLSI Design
- M.Tech. Wireless & Mobile Communication Systems

The Department of Electronics and Communications Engineering (ECE) was established in 1991 and offers one UG Programme, three PG Programmes and Doctoral Programmes.

ECE is a swiftly advancing field. From mobile phones to fibre optics and remote sensing, there are exciting avenues to explore and create. The ECE department at SRMIST prepares students for the best career openings in this discipline.

The Department has well-equipped labs and ample computing equipment, including personal computers running the full suite of Ansys HFSS, Keysight ADS, CADENCE, OrCAD, MATLAB and Network Simulation Software. It has USRP-RIO SDR hardware, Vector Signal Generator & Analyzer and Network Analyzer. It received significant research grants from the Department of Science and Technology (DST) under the Funds for Improvement of Science and Technology (FIST). It has also received funded research grants from the Defence Research and Development Organization (DRDO), Board of Research in Nuclear Science (BRNS) and Indian Space Research Organization (ISRO).

Full-Time and Part-Time Fellowships under the Visvesvaraya Ph.D Scheme for Electronics & IT from MeityGol are in progress. The Department has strong collaboration with industries and reputed institutes.

Accreditations

The B.Tech ECE programme at the Kattankulathur (Chennai) campus is accredited by ABET, USA. (<http://www.abet.org>).

Collaborations

- NuvoTon Semiconductor Corporation (P) Ltd., Taiwan.
 - Central Electronics Engineering Research Institute (CEERI) Chennai.
 - Samsung Research Institute - Bangalore. (SRI-B)
 - Raising Stars Mobile India Pvt. Ltd, Chennai.
 - Electronics Sector Skills Council of India
 - Keysight Technologies
-

Research Focus and Project Grants

ECE Dept. has well equipped labs and has ample resources in computing equipment, including personal computers running the full suite of Ansys HFSS, Keysight ADS, CADENCE, OrCAD, MATLAB and Network Simulation Softwares. It has, RF Vector Signal Generator & Analyzer, Network Analyzer and USRP-RIO SDR hardware. It received significant research grants from Department of Science and Technology (DST) under Funds for Improvement of Science and Technology (FIST). Received funded research grants from Defence Research and Development Organization (DRDO), Board of Research in Nuclear Science (BRNS) and Indian Space Research Organization (ISRO). Also received, Full-Time & Part-Time Fellowships under Visvesvaraya PhD Scheme for Electronics & IT from Meity, Gol. The department has strong collaboration with industries and reputed institutes.

Career Prospects

- Today, technology is growing at a rapid pace. In the future there is bound to be huge demand for competent engineers in electronic industry. These engineers
-

would be involved in creating and sustaining cutting edge technology to stay ahead in competition.

- Graduates in Electronics Engineering have opportunities in Government and private companies for installation, operation and maintenance of electronics equipment and systems.
- Defense, space and other large research organizations employ electronics engineers in design and development of complex devices and systems for signal processing and telecommunication.
- Industries involved in design and fabrication of devices, integrated circuits, embedded systems, electronic equipment, etc., have also provide large scale placements for engineers with this specialization.
- They may also work with computers and electronic equipment in the medical, manufacturing, industrial control, telecommunications, aeronautical and military fields.
- Knowledge of computer hardware, networking equipment and communication systems gives electronics engineering graduates an edge in the IT job market. The skills and understanding they develop through the course make them preferred as software professionals by IT companies.

With strong research tracks and industry oriented programmes, ECE is dedicated to provide exciting opportunities and better future prospects for the Next Generation Students.

B.Tech. Electronics & Communication Engineering

Different analog and digital modulation techniques used for communication, equipment and systems involved in wireless communications, satellite and optical communication technologies, computer communication and networking, design and development of microelectronic circuits for computation and processing, components and systems for electronic instrumentation and control etc., form a major part of the course content. The course also covers the study of hardware and interfacing of computer systems, programming skills and application of computers in signal processing and communication.

Core Courses

- Electronic Devices • Digital Electronic Principles • Signals and Systems • Electromagnetics & Transmission Lines • Analog Electronic Circuits • Linear Integrated Circuits • Microprocessor & Microcontroller • Digital Signal Processing • Analog & Digital Communication • VLSI Design
- Wireless Communications • Microwave & Optical Communications • Computer Communication Networks

Elective Courses

Sub-Stream: Electronic System Engineering

- Python and Scientific Python • Micro- & Nano-Fabrication Tech. • Semiconductor Device Modeling • ARM based Embedded System Design • FPGA based Embedded System Design
- Advanced Digital System Design • Real Time Operating Systems • CMOS Analog IC Design
- MEMS Technologies • Nanoelectronic Devices and Circuits • Microwave Integrated Circuits
- ARM-SoC • ARM based Digital Signal Processing • Applied Machine Learning

Sub-Stream: Communication System Engg.

- Advanced Mobile Communication Systems • Radar And Navigational Aids • Adhoc and Sensor Networks • Satellite Communication and Broadcasting • Cryptography and Network Security
- Information Theory and Coding • Optical Components, Systems and Networks • Software Defined Networks • RF and Microwave Semiconductor Devices • Opto Electronics • Advanced Optical Communication

Sub-Stream: Signal Processing

- Wavelets and Signal Processing • Signal Processing for Auditory System • Pattern Recognition and Neural Networks • Digital Image and Video Processing • DSP System Design • Adaptive Signal Processing • Machine Perception with Cognition • Multimedia Compression Techniques
- Acoustical Signal Processing • Automatic Speech Recognition

B.Tech.

ECE with specialization in Biomedical Engineering

Elective Courses

- Biomedical Instrumentation • Medical Imaging Techniques • Biomaterials and Artificial Organs
- Biosensors • Diagnostic and Therapeutic Equipment • Biomedical Signal Processing • BioMEMS
- Biomechanics • Rehabilitation Engineering • Biomedical Nanotechnology • Physiological Modelling and Simulation • Medical Image Processing • Body Area Networks and Mobile Health Care • Bio-inspired Human Machine Interface • Implantable Bioelectronics • Trouble Shooting and Regulatory Affairs in Medical Instruments • Biomedical Laser Instruments • Home Medicare Technology • Acoustics and Optical Imaging • Machine vision in Medical Technology

B.Tech.

ECE with specialization in Cyber Physical Systems

Advances in science and engineering has improved the link between computational and physical elements by means of intelligent mechanisms, dramatically increasing the adaptability, autonomy, efficiency, functionality, reliability, safety, and usability of cyber-physical systems involved in Smart Grid Networks, Smart Transportation System, Enterprise Cloud Infrastructure, Utility Service Infrastructure for Smart Cities, etc. This degree programme provides all the essential skill sets required for the professional in this domain.

Elective Courses

- Cyber Physical Systems (CPS) - Foundation / Intermediate Level • Embedded and Implanted Systems for CPS • CPS Enabled Sensors & Actuators • Unsupervised Intelligence in CPS • Real Time Cyber Physical Systems • High Performance CPS Computing • Cyber Physical Control Systems • Cyber Security • Cloud & Distributed Systems for CPS • CPS Applications and Standardisation • Mobile Cyber Physical Systems

B.Tech.

Electronics & Computer Engineering

Electronics and Computer Engineering is at the heart of most current technological breakthroughs. From embedded systems used in smart automobiles to using Computer based systems with Artificial Intelligence for exploring distant planets, this field of study plays a crucial role. This cross-discipline study gives students the advantage of becoming a multi-skilled professional Engineer. The core courses focus on basics of operating system structures, memory management, programming languages along with the core computer hardware architecture

basics and digital systems design. The Elective subjects provide knowledge on application domains like Machine Learning, Virtual Computing and Cyber physical systems. The hands-on practical labs and project work enhance the skill of students in both research and the work scenario.

Electronics & Computer Engg offers depth in a wide range of courses that will open doors to higher studies and many careers which include Embedded Systems, Information Technology, Artificial Intelligence etc.. Potential employers include Intel, L&T, ARM, Microsoft, IBM, Cisco, Oracle, Orange, Sun, Altera, Xilinx and many start-up companies.

Core Courses

- Solid State Semiconductor Devices • Fundamentals of Computer System Design • Signals and Systems • Analog Electronic Circuits • Data Structures and Algorithms • Linear Integrated Circuits • Object Oriented Design and Programming • Computer Organization and Architectures
- Microcontrollers and Interfacing • Database Management Systems • Hardware Interfacing and Networking • Embedded Hardware and Operating systems • Embedded System Design using FPGA • Applied Programming

Elective Courses

Sub-Stream: Electronics

- Electromagnetics and Antenna Theory • Control Systems: Theory and Applications • Applied Digital Signal Processing • Wireless and Optical Sensors • Digital Communication Systems
- Wireless Communication Networks • ASIC Design • Embedded Linux • Advanced Digital System Design • Cryptography and Network Security • Digital Image and Video Processing • Opto Electronics

Sub-Stream: Computer Engg

- Machine Learning - I • Data Analysis and Visualization • Principles of Cloud Computing
- Computer Vision • Data Mining and Analytics • Deep Learning • IoT System Design • Multi-Core Architecture and Programming • Principles of Artificial Intelligence • Principles of Cyber-Physical Systems • Hardware/Software Co-Design • Introduction to Virtual Computing • Mobile Computing • Web of Things • Quantum Computing

B.Tech.

ECE with specialization in Data Sciences

There is an increasing demand of capturing, analyzing, and synthesizing large amount of data sets in a number of application domains such as new scientific discoveries, business applications, policy making, and healthcare etc. As a result, the study of Electronics and Communication Engineering with Specialization in Data science has become essential to cater to the growing need for professionals and researchers to deal with the future challenges. The curriculum of the program focuses on exposing the students to the essentials of applied statistics, applied mathematics, essential electronics and computer science required in the context of data science and its applications with strong emphasis on having hands-on experience with real-world problems.

Elective Courses

- Introduction to Data Sciences • Machine Learning • Big Data Analytics • R Programming for Data Sciences • Python for Data Sciences • Deep Learning • Data Visualization Techniques and Tools • Mathematical tools for Data Sciences • Regression and Multivariate Data Analysis
- Natural Language Processing with Representation Learning • Data Wrangling • Data Base Management Systems • Data Engineering • Cloud and Distributed Computing • Information Storage and Management • Data base security and Privacy

B.Tech.

ECE with specialization in Instrumentation Engineering

Elective Courses

- Transducer Engineering • Measurements and Instrumentation • Automotive Instrumentation Systems
 - Safety Instrumented System • Industrial Instrumentation • Process Dynamics and Control
 - Modern Control System • Programmable Logic Controller • Graphical System Design in Virtual Instrumentation
 - Instrumentation and Control in Process Industries • Distributed Control System and SCADA
 - Building Automation • Instrumentation System Design • Factory Instrumentation Networks
 - IoT in Process Instrumentation and Automation • MEMS-based Microsystems Analysis and Design
 - Microsensors and Smart Devices
-

M.Tech.

Embedded Systems Technology

M.Tech in Embedded Systems Technology is a two-year post-graduate programme designed for engineers working in the embedded systems industry who want a sound and practical knowledge about hardware design and writing firmware for different microcontrollers (AVR, ARM, and PIC). This course offers knowledge and skill in designing and developing embedded systems involving, microprocessors / controllers, its hardware and software, real time operating systems and FPGA and SoC, with core subjects, supported by hands-on laboratories. The elective subjects provide knowledge on application domains of IOT, wireless technologies, DSP, networking, control system implementations, & engineering aspects. The programme focuses on multi-disciplinary domains in the areas such as automotive, avionics, consumer electronics, medical devices, and processor design. One full semester of project work, with research orientation, in any of the chosen core or application domains, enhances the skills of students for both research and the work scenario. Embedded systems play a key role in electronic devices. Multinational companies like Microsoft, Google, Cisco, TCS, IBM, etc. have invested huge money in this sector and there are many start-ups too.

Core Courses

- Digital System Design and Testing • Microprocessors & Microcontrollers • Embedded Systems Software
- Signal Processing for Embedded Systems • Real Time Operating Systems • Embedded System Architecture
- Microprocessor Architecture • VLSI Design Methodologies and Programming in HDL
- FPGA Design

Elective Courses

- Computer architecture • Embedded Linux • Principles of Distributed Embedded Systems
- Communication Network Processors • Embedded Wireless Sensor Networks • Wireless & Mobile Communication
- Embedded Control Systems • Intelligent Systems • Digital Image Processing
- Multimedia systems • DSP Integrated Circuits • Real Time Systems • Electronic Product design and reliability engineering
- Advanced Digital Image Processing • Thermal Image Processing
- Reconfigurable Architecture for Heterogeneous Systems • Oceanographic Sensor Systems
- Advanced Optical Instrumentation and Data Acquisition • Advanced Thermoelectric
- Physicochemical of Thermoelectric Energy • Retinal Image Analysis • IoT Technologies and Applications
- Quantum Information and Computing • Fundamentals of Quantum Computing
- Reversible Logic Optimization and Testing • Fetal Electrocardiography

M.Tech. Telecommunication Networks

M.Tech in Telecommunication Networks is a two-year postgraduate programme designed for students who want a career with in the telecommunications domain. The Telecommunications landscape is changing rapidly and it is currently undergoing tremendous growth. It is used in everything from ordering a pizza from a mobile app to the high-tech radar on a jet. The convergence of computer and telecommunications technologies promises innovative products and services that will revolutionize life and work. Telecommunications has been acknowledged as a vital ingredient of economic growth. Telecommunication networks are transmission systems enabling information to be transmitted in analogue or digital form between different sites by means of electromagnetic or optical signals. It facilitates interaction and information transfer over short and large distances. The information may consist of audio, video or multimedia data. The networks are based on either wired or wireless infrastructures. Typical examples of telecommunication networks are the telephone landline network, the mobile network, cable TV networks or the internet in public, private and defence domains. This M.Tech course with its core and elective subjects offers knowledge and skill in designing and developing components/systems for telecommunication networks. Wonderful and challenging opportunities are available in public and private telecom companies across the globe.

Core Courses

- Digital Communication Systems
- High Performance Data Networks
- Cryptography and Wireless Network Security
- RF System Engineering
- Network Routing Algorithms
- Wireless IP Communication Networks
- Wireless and Mobile Network Architectures
- AdHoc Wireless Networks

Elective Courses

- Multicarrier and Spread Spectrum Systems
- Wireless Body Area Networks
- Wireless Broadband Networks
- Cooperative Communications
- Wireless Local And Personal Area Networks
- Cognitive Wireless Networks
- Architectures and Protocols for Wireless Sensor Antenna Array Engineering
- Networks Millimeter Wave Communication
- Radio Network Planning and Optimization
- Telecom Billing and Revenue
- MIMO- OFDM Communication Networks
- Microwave Photonics
- TCP/IP Principles, Protocols and Architecture
- Optical Networking Technology
- Random Process and Statistical Methods
- Graph Theory and Optimization

M.Tech. VLSI Design

Very Large Scale Integrated (VLSI) Circuit Design is the process of designing a large computer chip (more specifically, an integrated circuit, or IC), using computer-aided design (CAD) tools on a workstation or a personal computer (PC). M.Tech in VLSI Design is a two-year postgraduate programme that aims to impart knowledge of VLSI system design, covering algorithms, hardware description languages, system architectures, physical designs, verification techniques, simulation and synthesis, low power design techniques etc. The recent advancements in VLSI design have enabled most systems to become compact and reliable and to deliver data at high speed. With the advent of VLSI designs, the number of applications of integrated circuits (ICs) in high-performance computing, controls, telecommunications, image and video processing, and consumer electronics has been rising at a fast pace. With advances in technologies like process geometries, feature and product innovations, there is a constant need to design, develop and re-engineer ICs. Since products like mobile phones are being released with new features in increasingly shorter cycles, there is a healthy demand for qualified very large-scale integration (VLSI) engineers to work on these products. Therefore, there is good scope and high demand for engineers in the fast-changing chip designing industry.

Core Courses

- Digital Systems Design using Verilog • MOS Device Modeling • DSP structures for VLSI • CMOS Analog VLSI • VLSI Design Automation • VLSI Technology • Testing of VLSI Circuits
- Reconfigurable Architectures for VLSI

Elective Courses

- Digital System Synthesis & Verification • Nano Electronics • Low Power VLSI Design • Neural Networks for VLSI • VLSI Digital Signal Processing systems • ASIC Design • CMOS Mixed signal Circuit Design • DSP Architectures and Applications • Design of Semiconductor Memories
- System-on-Chip design • Genetic Algorithms and their Applications in VLSI • Reliability Engineering • Fundamentals & Application of MEMS • RF VLSI Design • High Speed VLSI
- Magneto-electronics • VLSI interconnects and its design techniques • Digital HDL Design and Verification • Computational Aspects of VLSI • Computational Intelligence • Chromatic Graph Theory • Solar Cells and Thin Film Technologies • Next Generation Photovoltaics • Quantum Computation and Information • Superconductivity: Theory and its Effects • Multicore Processors and Scheduling Algorithms • Advanced Semiconductor Physics • Stochastic Computing and Process

M.Tech.

Wireless and Mobile Communication Systems

Wireless Communication is an advanced branch of communication engineering. M.Tech in Wireless and Mobile communication systems is a postgraduate programme designed to impart knowledge to students in the field of Wireless communication, a broad term that incorporates all procedures and forms of connecting and communicating between two or more devices using a wireless signal through wireless communication technologies and devices. Wireless communication involves transfer of information without any physical connection between two or more points. Because of this absence of any 'physical infrastructure', wireless communication has certain advantages, cost effectiveness, flexibility, convenience, speed, accessibility, constant connectivity etc.,

This programme is intended to expose students to the latest developments in the Communication industry. Students pursuing this programme will gain knowledge on various dimensions of communications like optical Communication, Satellite communication, Mobile communication etc. They will learn about various aspects of networking in each kind of wireless communication, such as network security, compatibility and interference issues. Graduates of this programme are in high demand in companies like TCS Digital, CISCO, Aricent Technologies and Google, to name a few.

Core Courses

- Coding Theory • Digital Communication Techniques • Optical Fiber Communication • Antenna Theory and Design • Mobile Communication Systems • High Speed Communication Networks
- Wireless MIMO Communications • Global Positioning Systems • Mobile Adhoc Networks
- Adaptive Signal Processing • Microwave Communication

Elective Courses

- Coding Techniques for Spread Spectrum Communications • Cognitive Radio Technology
- Communication Network Security • Digital Communication Receivers • Electromagnetic Interference & Compatibility in System Design • High Speed Switching Architecture • Microwave Integrated Circuits • Multi User Detection • Non Linear Fiber Optics • OFDM / OFDMA Communications • Optical Network & Photonic Switching • RF MEMS for wireless Communication
- Satellite Communication • Statistical Signal Processing • Statistical Theory of Communication
- UWB Communication Systems • WCDMA for UMTS • Wireless Sensor Networks • Stochastic Processes & Queuing theory • Multicasting Techniques in MANETs • Wavelet Transforms and Applications • Reconfigurable Antennas • Fiber Wireless Access Networks • Semiconductor Optical Amplifier based all Optical Circuits and Devices • Semiconductor Optoelectronic Devices • Wireless Optical Communication • Compressive Sensing • Photonic Integrated Circuits
- Integrated Photonic Micro Ring Resonators • Near Field Optics and Plasmonics • Signal Processing Techniques for Speech Recognition

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING



Undergraduate Programme

- B. Tech. in Electronics & Instrumentation Engineering
- M.Tech Electronics & Control Engineering

The Department of Instrumentation & Control Engineering was started in the year 1993-94 and the Department of Electronics & Instrumentation Engineering branched out from it in 2008-09.

Electronics & Instrumentation Engineers carry out the task of measuring, doing research, installing, developing, testing, maintaining and designing various instruments used in the industry. They aim to 'measure the world accurately and to control it precisely.'

The Department equips students with knowledge of instruments, automation, processing industries, micro-electronics and biomedical instruments and their management.

Accreditations

Electronics & Instrumentation Engineering Students are issued Degree certificates with the IET UK accreditation logo and the MITSUBISHI electric logo as well.

Facilities

- Centre for Advanced Complex Control and Embedded Systems (ACCES)
- Centre for Instrument Design and Measurement (IDM)
- Centre for Micro Electro Mechanical Systems (MEMS)
- Centre for Research in Human Movement Research and Analysis (HMRA)
- Centre for Cyber-Physical Systems (CPS)
- A National MEMS Design Centre (NMDC), was established as a centralized facility, under the National Programme on Micro and Smart Systems (NPMASS), IISc, Bangalore during 2009-2017
- Alumni sponsored lab 2019

Research

The Department has undertaken various consultancy assignments for the SRM medical college. It maintains strong ties with hospitals, industry and other academia.

Students undertake collaborative research with CSIR-CEERI Labs, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, Biosignals Lab, RMIT University, Australia etc. as well as with several industries.

Funded Projects

Two projects with a combined funding of over Rs. 86 Lakhs are underway.

- Industry-run Module & Certified Courses are conducted regularly by National Instruments, BOSCH and Johnson controls, Pune.
- The Department offers certified courses on Internet of Things (IoT) in association with Edgate Technologies under a Texas Instruments University Programme.
- The Department has been awarded 46 international and national patents since 2016. These are owned by students and faculty members.
- Every year, students qualify as Certified LabVIEW Associate Developers (CLAD) under the aegis of National Instruments.
- Students participate in various International Technical competitions like CANSAT, ROBOCON, etc. every year. CANSAT - Overall Rank - 5th, Asia Rank - 1st ; ROBOCON - Rank - 13th

Career Prospects

An Instrumentation Engineer can find job openings as Graduate Engineer Trainee in diverse fields, including:

- Oil & Gas Sector
- Process Industries
- Automation Industries
- Automotive & Aerospace Industries
- Power and Alternative Energy Sectors
- Healthcare Sector
- Robotics

B.Tech.

Electronics and Instrumentation Engineering

Graduates will be able to analyse, design, develop and maintain instrumentation systems of an industry. They can take up careers in optimization and automation of industrial process, keeping environment protection and safety parameters in view.

Core Courses

- Electronic Devices
- Digital Electronic Principles
- Signals and Systems
- Electromagnetics and Transmission Lines
- Analog Electronic Circuits
- Linear Integrated Circuits
- Microprocessor, Microcontroller and Interfacing Techniques
- Digital Signal Processing
- Analog and Digital Communication
- VLSI Design
- Wireless Communications
- Microwave & Optical Communications
- Computer Communication Networks
- Comprehension

Elective Courses

- Transducer Engineering
- Measurements and Instrumentation
- Automotive Instrumentation Systems
- Safety Instrumented System
- Industrial Instrumentation
- Process Dynamics and Control
- Modern Control System
- Programmable Logic Controller
- Graphical System Design in Virtual Instrumentation
- Instrumentation and Control in Process Industries
- Distributed Control System and SCADA
- Building Automation
- Instrumentation System Design
- Factory Instrumentation Networks
- IoT in Process Instrumentation and Automation
- MEMS-based Microsystems Analysis and Design
- Microsensors and Smart Devices





- DEPARTMENT OF NANOTECHNOLOGY

DEPARTMENT OF NANOTECHNOLOGY



Undergraduate Programme

- B. Tech. Nanotechnology

Postgraduate Programme

- M. Tech. Nanotechnology

The Department of Nanotechnology (supported by the Department of Science & Technology - Fund for Improvement of S&T in Higher Educational Institutions - DST-FIST, Government of India) was established in the year 1984. The Department has synergistic programmes in both educational and research endeavours. A flexible and dynamic curriculum, exciting research and global connections are the key features that take it to global standards. The research areas cover theoretical and experimental studies of various physical principles underlying fascinating topics such as microwaves, optics, crystal physics, semiconductor physics, atmospheric physics, biophysics, nanobiotechnology, sensors, energy storage systems and so on. The Department has 58 highly-qualified faculty members. The Department prepares students and faculty to face the critical challenges of changing technology by imparting effective training and exposing them to modern aids.

Facilities

There is a Centre for Materials Science and Nanodevices, which includes:

- Hydrogen Storage Materials and Nanosensors Laboratory.
 - A Futuristic Materials Research Centre for Planetary Exploration is among the lab facilities offered.
 - Characterization Facilities/Tech-niques include a Micro-Raman spectrometer, a Laser flash thermal conductivity system and a Semiconductor Parameter Analyser.
 - Wet chemistry labs, and a planetary ball mill are among the synthesis / Growth / fabrication facilities available.
 - Computational tools / software facilities includes ATK, TCAD and Gaussian O3 simulation tool
-

Research

There are several projects in progress. The Department has obtained research grants to the tune of Rs. 23.07 crores.

Funded Projects

Includes one on Satellite Meteorology Cell worth Rs.140.00 lakhs, from the Ministry of Earth Sciences.

Publications

The Department has published 396 articles in the last five years in SCI-Indexed, peer-reviewed journals, with an average impact factor of 3.754

- Exchange programme for students - 110 undergraduate, postgraduate and Ph.D students have visited Shizuoka University for Sakura and SSSV programmes. Two students have visited NCTU, Taiwan for TEEP.
- Eight visiting professors from Premier Institutions like Shizuoka University, Japan, GNS, New Zealand, Tohoku University, Japan, and Open University, UK.
- Corporate Advisory Board - Representatives from leading industries and organizations are members of this board.
- Periodic Outreach Activities - Community Radio, Science Camps, etc.
- Biennial International Conferences - ICONN, SRMIST-IITM-MRSI EESTER
- Regular Talks by Expert /Workshops - ISCA, Research Colloquium, etc.

Career Prospects

Nanotechnology has revolutionised the electronics / semiconductor industry, biotechnology, medical and pharmacology sector, energy sector and so on. Thus, students of nanotechnology have career opportunities in organisations such as Seagate Technology, Advanced Materials Corporation, Carborundum Universal Limited, Log 9 Materials, EucareUrgo Pharmaceuticals, Advanced Tech, etc. They are placed in R&D, Product Development and Quality Control departments. They also thrive as entrepreneurs. Many of our students pursue higher studies in world-class universities like MIT, University of Washington, Harvard University, etc.

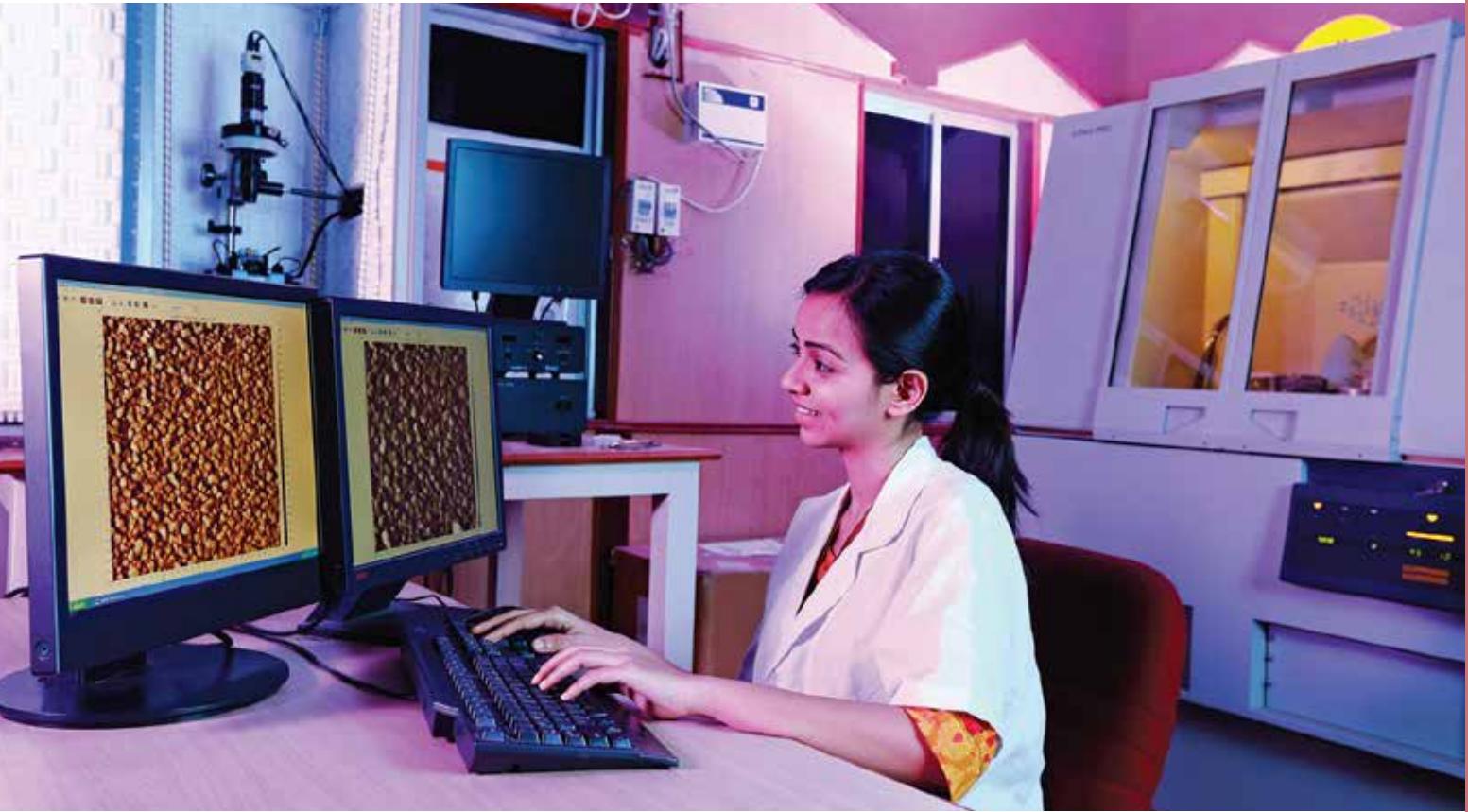
B.Tech. Nanotechnology

Nanotechnology deals with understanding the physical and chemical principles of nanostructures and developing technology with enhanced functionality. It is multi-disciplinary in approach and encompasses all areas of science and technologies and has application in electronics, telecommunications, computing, aerospace, renewable energy, environment, healthcare, biotechnology, etc. This course introduces the student to various aspects of Nanoscience and Nanotechnology, design and fabrication of Nanomaterials, concepts and functioning of advanced characterization tools for Nanostructures and diversified applications of Nanomaterials.

Core Courses

- Nanoscale Chemistry • Quantum Mechanics for Nanotechnologists • Nanoscale Materials Laboratory • Thermodynamics and Statistical Mechanics • Biological Principles for Nanoscale Science • Design and Synthesis of Nanomaterials • Advanced Characterization of Nanomaterials
- Modelling and Computational Tools • Solid State Engineering • Nanophotonics
- Nanobiotechnology • Nanotoxicology and Nanotechnology • Nanoelectronics • Micro and Nanofabrication • Polymer and Nanocomposites





Electives Courses

- Carbon Nanotechnology • Physics of Solid-state Devices • Molecular spectroscopy and its applications • Nanotribology • Nanotechnology Legal Aspects • Lithography Techniques and Fabrication • Sensors and Transducers • 2D Layered Nanomaterials • Supramolecular Systems
- MEMS and NEMS • Surface and Interfaces • Nanotechnology in Food Production • Advanced Drug Delivery Systems • Nanomedicines • Microelectronics and VLSI • Physics of Electronic Materials • Nanocatalysts • Nano and Micro Emulsions • Nanorobotics • Micro and Nanofluids
- Nanotechnology for Energy Systems • Photovoltaic technology • Nanotechnology in Cosmetics

M.Tech. Nanotechnology

The course provides fundamental and advanced knowledge in Nanoscience and Nanotechnology and an understanding of the concepts of Nanomaterials synthesis and characterization. It also imparts to students a professional, ethical and multidisciplinary approach to work in different areas of Nanotechnology.

Core Courses

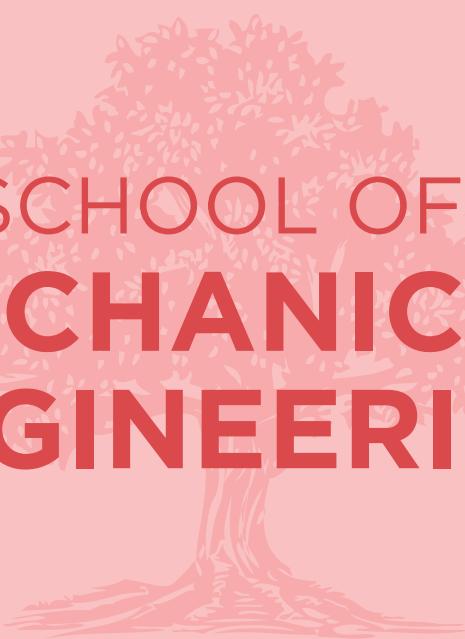
- Fundamentals of Nanoscience and Nanotechnology • Nanoscale Materials: Synthesis and Characterization • Metamaterials and Nanophotonics • Applied Mathematics in Nanotechnology
- Nanoscale Technology in Biological Systems • Molecular and Nanoelectronics • Industrial Trends and Applications of Nanotechnology

Electives Courses

- Societal Impacts of Nanotechnology • Nanotechnology in Healthcare • Nanotechnology in Energy Conversion and Storage • Nanoscale Magnetic Materials and Devices • Metallopolymer Nanocomposites • Nanotoxicology • Green Manufacturing Technology • Advanced Crystal Growth Techniques • Carbon Nanotube Electronics and Devices • Nanoscale Integrated Computing • Micro / Nano Devices and Sensors • Spectroscopic Techniques for Nanomaterials
- Chemistry of Nanomaterials • Thin film Science and Technology • Micro / Nano Colloids and Emulsions



AIRCRAFT STRUCTURES
SECTION



SCHOOL OF
**MECHANICAL
ENGINEERING**

- DEPARTMENT OF AEROSPACE ENGINEERING
- DEPARTMENT OF AUTOMOBILE ENGINEERING
- DEPARTMENT OF MECHANICAL ENGINEERING
- DEPARTMENT OF MECHATRONICS ENGINEERING

DEPARTMENT OF AEROSPACE ENGINEERING



Undergraduate Programmes

- B.Tech. Aerospace Engineering
- B.Sc. (Honors) in Aircraft Maintenance

Established in 2007 with a modest intake of 42 students, the Department of Aerospace Engineering has been admitting an average of 120 students per annum during the last decade. Qualified and dedicated faculty members and state-of-the-art infrastructure are among the strengths of the Department, which attracts highly motivated students. The main objective is to groom students into knowledgeable and competent aerospace engineers who will be an asset to Indian space research programmes and the fast-growing aviation sector. With the explosive growth in civil aviation, satellite communications and space exploration, there are bright career prospects for graduate aerospace engineers. The Department supports and motivates students for higher studies in reputed institutions. Presently, it has 23 teaching faculty members with vast experience and knowledge, supported by 10 non-teaching staff members. Extensive research is carried out in the areas of Aerodynamics, Propulsion, Structures and Flight Mechanics by faculty members and students.

Facilities

- Aero Fluid Dynamics Lab
 - Aerodynamics Lab
 - a. Low-Speed Aerodynamics Lab
 - b. High-Speed Aerodynamics Lab
 - Aerospace Propulsion Lab
 - Aircraft Structures Lab
 - Material Testing Lab
 - Computational Fluid Dynamics Lab
 - Advanced Computing Lab
 - Avionics Lab
 - Software: Ansys, Catia, OpenFOAM® and NI Labview
-

Research

Aerodynamics and aero-acoustics of jets and rotors are studied using the anechoic chamber developed by students via jet facility and tabletop propeller set-up.

Hypersonic Aerodynamics research involves numerical simulation of re-entry vehicle flow physics, design optimisation of planetary entry vehicles, spacecraft trajectory optimisation in terms of minimum fuel requirement and energy and space debris collision avoidance systems for spacecraft.

Research on hybrid rocket motors is carried out. Various performance parameters of hybrid rocket combustion, like burn time, regression rate, chamber wall temperatures and nozzle exit temperature are investigated using careful and precision static firing tests.

Research involving full aircraft with active landing gear system aims at building an active landing gear system and saving the manufacturer development costs.

Numerical investigation is also in progress on opposed flow flame spread in partial and elevated gravity environments.

Funded Projects

The Aeronautics Research and Development Board, Ministry of Defence, has sanctioned a project on Design and Analysis of Aircraft Active Landing Gear to study the Dynamic Response of the Aircraft during Heavy Landing, Taxiing on Uneven/Random Runway Surfaces. The budget is Rs. 7.03 lakhs.

The National Atmospheric Research Laboratory, ISRO has sanctioned a project on "Development of Drone for High Altitude Weather Monitoring" to study the atmospheric parameters upto an altitude of three km with 3 Kg payload. The amount sanctioned is Rs.5 lakhs.

- Fully functional Cessna aircraft and Euro-copter
- Semester Abroad Program at IIT USA, IPSA France and NGU Taiwan.
- Students are very successful in GATE exams and securing admissions to postgraduate courses
- Active student clubs like SAE Aerospace Collegiate Club and SRM Air Community

Career Prospects

The International Air Transport Association (IATA) forecasts that global passenger numbers will almost double by 2036, rising to 7.8 billion. To match that demand, the aviation industry is continuing to raise output to historic levels. As airlines continue to take delivery of new airplanes, advances in airplane technology will drive an increased need for technicians skilled in avionics, composites, and digital troubleshooting. In addition, aerospace engineers have wide scope in Defence Research & Development Organisation (DRDO) projects to develop light combat aircraft and in Indian Space Research Organisation (ISRO) space research programmes.

B.Sc. (Honors) in Aircraft Maintenance

1. Airport segment-Airside Management, Terminal Management, Cargo, Engineering and Maintenance
2. MRO-INDIA-Hangar Maintenance (AMEs / Technicians), Operations Support Services, Maintenance Planning Quality Assurance, Security
3. Airline segment-MRO, pilots and co-pilots, other flight crew, cabin crew, ticketing and sales, other personnel.

B.Tech. Aerospace Engineering

Aerospace Engineering deals with the design, development and maintenance of flying machines and launch vehicles via subjects like aerodynamics, propulsion and aerospace structures. It is the art of applying Mathematics and Science to create safer and faster transportation for mankind. Aerospace Engineers have high scope of employment in the Research and Development sector after pursuing Masters in the specified field.

Core Courses

- Applied Engineering Mechanics • Applied Fluid Mechanics • Aero Engineering Thermodynamics
- Aircraft Materials and Production Techniques • Aircraft Systems and Instruments • Applied Solid Mechanics, Incompressible Aerodynamics • Air Breathing Propulsion, Compressible Aerodynamics • Rocket Propulsion • Aircraft Structures, Flight Dynamics - I • Introduction to Space Technology • Flight Dynamics - II • Vibrations & Elements of Aeroelasticity • Digital Avionics, Multi-Disciplinary Design.

Elective Courses

- Industrial Aerodynamics • Applied Structural Mechanics • Experimental Stress Analysis
- Composite Materials & Structures • Theory of Plates and Shells • Theory of Elasticity
- Fundamentals of Combustion • Heat Transfer • Theory of Fire Propagation and Safety



- Airframe Maintenance and Repair • Airborne Sensors and Actuators • Aircraft Control Systems
- Helicopter Aerodynamics • Rocket Aerodynamics • Space Mission Design and Analysis • Computational Heat Transfer & Fluid Dynamics • Rockets and Missiles • Fatigue and Fracture Mechanics • Cryogenic Engineering • Aircraft Engine and Instrument Systems • Helicopter Maintenance • Aerial Robotics • Turbulence and Turbulence Modelling • High Temperature Gas Dynamics • Hypersonic Aerothermodynamics

B.Sc. (Honors) in Aircraft Maintenance

In order to meet the qualified and trained manpower requirements of the aircraft maintenance industry this degree course has been introduced from the academic year 2020-21.

The major features of the new course are: 1. Students who have passed Plus 2 with 50% in PCM (or equivalent) are eligible to apply 2. The curriculum has been prescribed by a committee of experts appointed by UGC 3. Emphasis on hands-on training with only one basic Mathematics course 4. Scope for clearing the modular examinations conducted by DGCA

Core Courses

- Aircraft Structure and Associated Systems • Aerodynamics • Mathematics • English Communication • Electrical Fundamental-I • Electronics Fundamentals & Digital Techniques- • Physics • Environment Science • Aircraft Materials & Hardware • Electrical Fundamental-II • Gas Turbine Engine • Chemistry • Electronics Fundamentals & Digital Techniques -II • Aircraft Maintenance Practices • Aircraft Structure -I • Corrosion and NDT Techniques • Workshop Practices • Aircraft Structure & Systems-II • Avionics • Ground Handling Support System • Skill Enhancement Course

Elective Courses

- Piston Engine and Propeller • Rotorcraft and Rotorcraft Autopilot • Human factors
- Transducers and Sensors

DEPARTMENT OF AUTOMOBILE ENGINEERING



Undergraduate Programmes

- B.Tech. Automobile Engineering
- B.Tech. Automobile Engineering (Specialized in Automotive Electronics)
- Automobile Engineering with specialisation in Vehicle Testing (in collaboration with GARC)

Postgraduate Programmes

- M.Tech. Automotive Hybrid Systems Engineering NFT DC
- M.Tech. Electric Vehicle Technology (in collaboration with Valeo)

The Department of Automobile Engineering at SRM IST was established in 2004 with a vision of being recognized as a Department of international repute. It aims to offer knowledge to the students on the elements of mechanical, electrical, electronics, software and safety engineering as applied to the design, manufacture and operation of motorcycles, buses, trucks and electric & hybrid vehicles and their respective engineering subsystems. Further, to align with the global challenges in e-mobility, it works hand-in-hand with the industry and government bodies. It has 32 faculty members and one adjunct faculty member, all with a broad area of expertise and interests. With over 500 graduate students, postgraduate and research scholars, the department's strength is reinforced further with dedicated technicians and support staff.

In collaboration with over 10 companies, governmental agencies and institutions, the Department efficiently introduces and promulgates joint research activities & student exchange programmes. This provides the students diverse opportunities to work upon and relate, thereby bridging the gap between the Universities and the Industry.

Facilities

The lab facilities available include:

- Vehicle Testing Lab
- Automotive Components Lab
- Automotive Electronics Lab
- Automotive Electrical Lab
- Electric Vehicle Lab
- Engine Testing Lab
- Vehicle Dynamics Lab
- Machine Shop
- Driver Simulator Lab
- Artefact Dissection Lab

Training

SRMIST has been an authorized training partner of the Automotive Skills Development Council (ASDC) since December 2017. The ASDC is the first sector in the skill council of India, promoted by the Automotive Industries. The SRM-ASDC Centre provides hands-on training skills as per the National Skill Development Corporation (NSDC) standards in the following segments: • Automotive Service Technician • Automotive Electrician • Automotive Brake Specialist • Automotive AC Specialist

Software

ANSYS 18, SOLID WORKS, CATIA V6, MATLAB, MODELICA, GT-Suite

Research

The Green Vehicle Technology Research Centre focuses on the development and testing of sustainable green vehicles. The Centre for Automotive Materials focuses on the R&D of Automotive Materials. The Automotive Electronics Laboratory has been concentrating mainly on electric vehicles, especially in the two-wheeler domain, and on the application of IoT in the automobile sector. Vehicle Dynamics is working on Magnetorheological dampers. Research activities include causal modelling of structures and mechanisms using Simulink / MATLAB, Acausal / Physical modelling using Modelica and Multibody analysis and dynamic analysis of vehicles using Carmaker software.

Publications

More than 100 scientific research articles have been published jointly by faculty members and students in SCI refereed journals with an average impact factor of 2.06.

Funded Projects

Several research projects funded by various institutions have been completed / proposed.

- i. Partnership with Polytechnic University, Hauts-De-France, to work on various topics. As part of this research collaboration, students and faculty are exchanged among the universities.
- ii. Ties with Renault Nissan, Mahindra, Apollo Tyres, Brakes India, Sharada Motors and other reputed companies boost internship opportunities, research projects and training programmes.
- iii. Students participate in design, manufacturing and testing of automobiles and other events across the globe.
- iv. More than 30% of graduates from the department prefer to pursue their higher studies in leading universities across Europe, USA & Canada. Several become entrepreneurs as well.

Career Prospects

The Department of Automobile Engineering prepares students for both employment and higher studies while building sound interpersonal skills, technical knowledge and logical skills. Recent employers/recruiters of our Automobile Engineering graduates include Hyundai, Larson & Toubro, Fiat-Chrysler Automobiles, Royal Enfield, LUK, Mahindra, JK Tyre, Renault Nissan, Ashok Leyland, Anand, Continental, TAFE, Daimler and TVS.

B.Tech. Automobile Engineering

B.Tech. Automobile Engineering (Specialized in Automotive Electronics) & B.Tech. Automobile Engineering (Specialization with Automotive Vehicle Testing)

The objective of the B.Tech Automobile Engineering Programme is to produce graduates who are:

- Employable in industry, government, or entrepreneurial endeavours
- Demonstrate the ability to work effectively as part of a team / as leaders in the ever-changing professional environment
- Take up advanced degree or certificate programmes in Electric Vehicle Technology, Connected Vehicles and other professionally related fields.

This field provides tremendous opportunities for engineering professionals, young engineers etc., across the world. Students will study various module-based courses such as testing standards & homologations, accident investigation & data acquisition, Advanced Driver Assistance Systems



(ADAS), fatigue engineering, electric & hybrid vehicles testing, vehicular vibration and acoustics etc. This programme is jointly offered by SRMIST and Global Automotive Research Centre (GARC - NATRIP, Under Government of India), Chennai. The course is designed so that students have their first three years (ie., up to six semesters) of study at SRMIST, Chennai while the seventh and eight semesters are conducted at both SRMIST & GARC premises by the experts from this field.

Core Courses

- Thermodynamics • Manufacturing Technology for Automotive Engineers • Automotive Components and Assembly Drawing • Mechanics of Solids • Applied Thermal Engineering for Automotive Engineers • Fluid Mechanics • Strength of Materials Laboratory • Fluid Dynamics Laboratory • Automotive Engines • Materials Technology • Machines and Mechanisms • Vehicular Structures and Driveline Systems • Materials Technology Laboratory • Automotive Electrical and Electronic Systems • CAD Analysis for Automotive Engineers • Design of Automotive Components • Vehicle Dynamics • Vehicle Testing Laboratory • Comprehension

Elective Courses (B.Tech. Automobile Engineering)

Sub - Stream: Manufacturing: • Automotive Components Manufacturing • Welding and Joining Techniques • Automotive Surface Engineering • Agile Manufacturing • Manufacturing Systems and Simulation • Advanced Manufacturing Process • Computer Integrated Manufacturing • Process Planning and Cost Estimation • Automotive Quality Systems • Industrial Engineering and Operational Research.

Sub - Stream: Engine: • Heat, Ventilation and Air Conditioning • Engine Testing and Validation • Fuel Testing and Standards • Automotive Exhaust System Development • Engine Auxiliary Systems • Design of Automotive Thermal System • Simulation of IC Engines • Automotive Emission Formation and Controls • Alternative Fuels and Energy Systems.

Sub Stream: Design: • Automotive Driveline Design • Automotive Chassis Component Design • Vehicle Design Data Characteristics • Concepts of Engineering Design • Rapid Prototyping and Tooling • Modeling and Control of Vibration in Mechanical Systems • Optimization Techniques in Engineering Design • Multi Body Dynamics • Finite Element Analysis • Sensors, Actuators and Signal Conditioners.

Sub Stream: Vehicular Technologies: • Auxillary Vehicle Systems • Two and Three Wheeler Technology • Vehicle Performance and Testing • Tyre Technology • Motor Sport Technology • Automotive NVH • Advance Vehicle Technology • Automotive Safety and Ergonomics • Vehicle Maintenance • Vehicle Body Engineering and Aerodynamics.

Elective Courses (B.Tech. Automobile Engineering Specialised in Automotive Electronics)

- Analog and Digital circuits for Automotive Applications • Principles of Linear Systems and Signals • Automotive Infotronics • Artificial Neural Networks and Fuzzy Logic • CAD for Electronics • Automotive Control Microcontrollers • Automotive Control Engineering • Power Electronics for Electric Vehicle Application • State Space Analysis and Digital Control System
- Model Based System Design • Modelling and Control of Electric and Hybrid Vehicles • Vehicle Stability and Control Systems • Automotive Fault Diagnostics • Electronic Engine Management System.

Elective Courses (B.Tech. Automobile Engineering Specialization with Automotive Vehicle Testing)

- Accident Investigation and Data Acquisition • Advance Driver Assistance Systems • Automotive Infotronics • Automotive Materials and Testing • Automotive Safety and Lighting Systems • Automotive Regulations, Homologations and Certification • Electric & Hybrid Vehicles Testing • Electro Magnetic Competence & Electro Magnetic Interference (EMC & EMI) • Engine Testing (Performance & Emission) • Fatigue Engineering • Tyre Dynamics and Testing • Vehicle Stability and Control Systems • Vehicle Crashworthiness and Occupants Safety • Vehicular Vibration and Acoustics

M.Tech.

Automotive Hybrid Systems Engineering

The course provides knowledge on hybrid electric vehicle system design, architecture and its subsystems. The Objectives of the programme are:

- To study the different motor drives and controllers used in xEV / HEV's.
- To study the different materials and manufacturing processes used in the manufacturing of automotive systems.
- To study the different energy storage devices and thermal management involved in hybrid electric vehicle drives.
- To study the power electronics components required for xEV's and its characteristics.
- To study the characteristics of control systems and various instruments used for measurements.





Core Courses

- Automotive Engine Systems • Automotive Chassis and Transmission Systems • Mechanical Vibrations • Automotive Electronics For xEV's • HEV/ xEV System Design Architecture • xEV Motor Drives and Controllers

Elective Courses

- Materials and Manufacturing Processes for Automotive Systems • Thermal Management of Hybrid Systems • Energy Devices for xEV Drives • Advanced Power Electronics for xEV's
- Control Systems and Instrumentation • System Engineering and Integration • Lean Combustion Technology • Advanced Fuel Technologies for SI Engines

M.Tech.

Electric Vehicle Technology

Electric Vehicle Technology (EVT) programme will help students understand elements of engineering and technology in mobility applications using electric vehicles, a topic which is gaining momentum worldwide. The course will provide candidates an understanding ofxEV/Electric vehicle design - Power, Torque, and vehicle performance characteristics, Engine and/or Motor selection, MATLAB - Simulink Vehicle Modelling, Battery Pack design considerations and Power/Energy Density and storage, testing procedures, infrastructural, environmental and economy aspects etc.,

Core Courses

- Automotive Chassis & Transmission Systems • Vehicle dynamics • Automotive Electronics
- HEV / EV System Design Architecture • EV Motors, drives and controllers • Energy Resources and Storage devices for EV

Elective Courses

- Thermal Management of Electric Vehicle Systems • Advanced Power Electronics for EV's
- Control Systems & Instrumentation • System Engineering and Integration • Model based Simulation of Electric Vehicles • Energy Generation, Distribution and Charging Infrastructure
- Electric Vehicles Testing, Standards and Legislation • Lean Combustion Strategies for Internal combustion Engines

DEPARTMENT OF MECHANICAL ENGINEERING



Undergraduate Programmes

- B.Tech. Mechanical Engineering
- B.Tech. Mechanical & Automation Engineering
- B.Tech. Mechanical Engineering with specialization in Artificial Intelligence and Machine Learning

Postgraduate Programmes

- M.Tech. Computer Aided Design - CAD
- M.Tech. Computer Integrated Manufacturing - CIM
- M.Tech. Robotics
- M.Tech. Solar Energy

Mechanical engineers require a solid understanding of key concepts like mechanics, thermodynamics, energy and manufacturing. They use these principles in design, analysis, machinery and much more. Principle study topics include fluid mechanics, thermodynamics and heat transfer, solid mechanics, materials engineering, manufacturing, energy systems, dynamics and control, Computer Aided Design (CAD), and Computer Integrated Manufacturing (CIM). This broad and flexible programme allows students to customize their programmes to meet their objectives and particular career goals. Traditional students can prepare for technological careers in industry, graduate school or management. The interdisciplinary students can utilize this programme as a launching pad for professional careers in business or public service. The postgraduate programs prepare students for design positions that require skilled and imaginative solutions to engineering problems in their specializations. Students in these programmes are provided with good computational knowledge and exposed to mechanical engineering software.

Acccreditation:

The B.Tech - Mechanical Engineering programme at Kattankulathur, Chennai campus is accredited by Accreditation Board for Engineering and Technology (ABET), USA. (<http://www.abet.org>)

Research

The Department offers Ph.D. programmes in major areas of Mechanical Engineering like design, thermal and manufacturing engineering in both full-time and part-time mode. Research areas include machining, bio-mechanics, bio-fuels, composites and energy.

- 146 papers published in refereed international journals • Over 28 laboratories • Visiting professors from international universities • Rapid prototyping lab, CMM lab, robotics lab, bio-mechanics lab • Active learning laboratory along the lines of the Discovery Laboratory at MIT, Boston

Career Prospects

The programme enables the students to take up careers in a broad spectrum of industries. Many of the IT industries have CAD / CIM divisions, which increases the job potential of mechanical engineers. Around 70% of students are placed in reputed industries, practicing core and allied engineering through campus recruitment. The remaining 30% prefer higher studies in India and abroad.

B.Tech. Mechanical Engineering

The B.Tech. Mechanical Engineering programme is a 4-year undergraduate course. The market scenario and demand for engineering graduates change every year, but mechanical engineering is an evergreen branch. Mechanical engineering graduates find placements in almost every sector, from construction to steel and from automobile to software. The objective of the mechanical engineering programme is to prepare students to apply the principles of this discipline to design, materials, manufacturing, automation, energy and maintenance of mechanical systems.

Core Courses

- Basic Civil and Mechanical Engineering • Thermodynamics • Fluid Mechanics • Manufacturing Technology • Engineering Mechanics • Mechanics of Solids • Applied Thermal Engineering • Materials Technology • Machines and Mechanism • Heat and Mass Transfer • Metrology and Quality Control • CAD / CAM • Mechanical Engineering Design

Elective Courses

- Fundamentals of Vibration and Noise • Industrial Tribology • Mechanism Design, Analysis and Synthesis • Design for Manufacturing and Assembly • Finite Element Methods • Advanced Strength of Materials • Automotive Engineering • Foundation Skills in Integrated Product Development • Modeling Systems • Human Body Mechanics • Design of Transmission Systems
 - Optimization in Engineering Design • Tool Engineering Design
-

B.Tech. Mechanical & Automation Engineering

Elective Courses

- Sensors and Actuators for Automation • Microprocessor and Microcontrollers • Industrial Robotics and Automation • PLC and its Application • Flexible Manufacturing System • IoT in Automation • Virtual Instrumentation • Neural Network and Fuzzy systems • Elements for Mechatronics
-

B.Tech. Mechanical Engineering with specialization in Artificial Intelligence and Machine Learning

Elective Courses

- Mathematics for Machine Learning • Probability and Statistics • IoT Device Design
 - Programming for Machine Learning • Artificial Neural Network • Machine Diagnostics and Condition Monitoring • Digital Image and Signal Processing • Machine Learning and Its applications in Mechanical Engineering • Artificial Intelligence for Mechanical Engineering
-

M.Tech. Computer Aided Design

M.Tech. in CAD is a postgraduate programme being offered by the Department of Mechanical Engineering since the year 2000. This programme prepares students for design positions in industry that require skilful and innovative solutions to engineering problems in their field of specialization. Students are exposed to the latest software and industry practices. The programme is designed as an interdisciplinary one, focussing on real-time industry projects and practice-based-learning. Research takes place in the areas of design, assembly planning, optimization, analysis and synthesis, bio-mechanics, rapid prototyping, VR, and AR.

Core Courses

- Computer Graphics • Computer Applications in Design • Finite Element Analysis • Optimization in Engineering Design • Mechanical Vibrations • Design of Material Handling Equipment's
- Computer Aided Manufacturing • Design for Manufacture • Mechanical Behaviour of Engineering Materials • Computer Integrated Design

Elective Courses

- Design of Hydraulic and Pneumatic Systems • Advanced Finite Element Analysis • Advanced Strength of Materials • Tribology in Design • Advanced Mechanism Design • Composite Materials and Mechanics • Mechatronics • Neural Networks, Gas and its Applications • Concurrent Engineering • Integrated Product Design and Development • Industrial Robotics and Expert Systems • Rapid Prototyping and tooling • Biomechanics • Aerospace system Control and Estimation • Visual Programming and its Application • Object Oriented Software Technology
-

M.Tech. Computer Integrated Manufacturing

M.Tech. in Computer Integrated Manufacturing is a postgraduate programme, dealing with the process of manufacturing with the integration of computers. The curriculum is constructed in such a manner that every area of manufacturing and the application of computational techniques

to it is covered. Students are facilitated in gaining high-level knowledge in the field of automation and manufacturing using computer applications.

Core Courses

- Computer Aided Design in Manufacturing • Finite Element Analysis in Manufacturing • Principles of Computer Integrated Manufacturing Systems • CNC Machining Technology • Manufacturing information systems • Manufacturing Systems Simulation • Sensors for Intelligent Manufacturing and Condition Monitoring • Computer Aided Inspection and Non Destructive Evaluation • Advanced Materials Engineering

Elective Courses

- Concurrent Engineering • Rapid Prototyping and Tooling • Applications of Computers in Manufacturing • Artificial Intelligence and expert systems in Manufacturing • Automated Material Handling Systems • Computer Aided Process Planning • Design for Manufacture and Assembly • Design of Experiments • Flexible Manufacturing Systems

M.Tech. Robotics

M.Tech. in Robotics is a postgraduate programme that provides students real-time experience in industrial robots. The state-of-the-art facilities focus on all-round development in robotics. The curriculum is designed to make students industry-ready. Students are exposed to the latest software and industry practices. The programme is an interdisciplinary one, focussing on real-time industry projects and practice-based-learning.

Core Courses

- Fundamentals of Robotic systems • Micro Controller and its Application in robotics • Drives and Control Systems for Robots • Computer Aided Design and Manufacturing • Kinematics and Dynamics of Robots • Robot Programming

Elective Courses

- Advanced Strength of Materials • Neural Networks, Gas and its Applications • Rapid Prototyping and Tooling • Visual Programming and its Application • Group Technology and Cellular Manufacturing Systems • Global Optimization Algorithms • Design of Experiments • Robot Vision • Robotic Simulation • Robotic Sensors

M.Tech. Solar Energy

The M.Tech programme in Solar Energy provides an in-depth understanding of various aspects of the subject and also addresses the issues of solar energy technologies and power generation, both photovoltaic and solar thermal. This programme will meet the emerging need for skilled human resources in solar energy technologies.

Core Courses

- Solar Radiation and Energy Conversion • Heat Transfer in Solar Systems • Control and Drives for Solar Systems • Instrumentation and Control in Energy Systems • Solar Collectors • Solar Thermal Systems • Solar Photovoltaic Systems

Elective Courses

- Materials Science for Solar Applications • Design of Solar Energy Systems • Modelling and analysis of Solar Systems • Structural Analysis in Solar System Design • Nano Materials for Solar Applications • Energy Conservation and Management • Energy Efficient Buildings and Systems • Advanced Energy Storage • Research Methodology and Experimental Techniques • Energy Economics and Policy • Conventional and Alternative Energy Systems • Computational Fluid Dynamics • Indian and Global Energy Scenario

DEPARTMENT OF MECHATRONICS ENGINEERING



Undergraduate Programmes

- B.Tech. Mechatronics Engineering
- B.Tech. Mechatronics Engineering with specialization in Robotics

Postgraduate Programme

- M.Tech. Mechatronics Engineering

Mechatronics Engineers are best known for their role as system integrators. With the advent of automation, there is a demand for engineers who can understand and unlock the seamless interactions among many disciplines such as Mechanical, Electrical, Electronics Control and Intelligence. This is exponentially increasing the demand for Mechatronics Engineers and opportunities in the future.

The B.Tech. programme in Mechatronics was introduced in the academic year 2005-2006 under the Department of Mechatronics Engineering. Since its inception, around 1400 students have graduated from the Department. It has around 35 faculty, with expertise ranging from fundamental to advanced Mechatronics and Robotics. The Mechatronics Engineering curriculum is a blend of Mechanical, Electrical, Electronics, Computer Science and Control Engineering. They together provide unique and intelligent solutions to engineering problems. Mechatronics Engineering has a broad spectrum of applications and opportunities in Automation, Industrial robotics and Unmanned autonomous vehicles such as driverless cars and drones, integrating AI systems, Cyber-Physical Systems(CPS) and Industry 4.0

Facilities

The Department has the following labs for academic and research purposes:

- Sensors and Actuators lab
- Electronics Devices and Circuits lab
- Signal processing and Embedded Control Systems lab
- Mechatronics lab
- Motion Analysis lab
- Autonomous System lab
- Smart Actuators lab

Research

- ABB IRB 14000 (Yumi) Dual ARM Collaborative Robot, the first of its kind in India
- Computer Vision Systems
- Keysight Test and Measurement Equipment
- Workstations for State-of-the-art Deep Learning Training
- Hardware in Loop Testing Platforms
- AI and computer vision enabled robot – National Instruments and Nvidia based.
- Dspace and PXI controller for hardware in loop simulation
- Festo closed loop fluid power system
- Software used: Labview, MultiSIM, MatLab, RoS and Webots

Semester Abroad Program

Under the Semester Abroad Program, 44 students have been sent to universities like Massachusetts Institute of Technology-USA, Lancaster University - UK, University of California-Davis, USA and Kyushu Institute of Technology-Japan, Tokai University and Arizona State University.

Research

The Department offers Ph.D programmes in specialized areas and leading disciplines of Mechatronics Engineering. The thrust areas of research include Autonomous systems, Deep learning, Smart materials for actuators, Robotics, Continuum Manipulators, precision machining, computer vision, vehicular networking and control and Automotive electronics. In addition to academic laboratories the department has research laboratories namely Autonomous systems lab, Motion analysis lab and Smart actuators lab.

Career Prospects

Well known as system-integrators in the engineering community, Mechatronics Engineers are the source of highly multi-skilled workforce in small scale industries utilizing automation to modern factories focusing Industry 4.0, Internet of Things (IoT) and Cyber Physical Systems (CPS).

Modern machines do not belong exclusively to any one branch of engineering, they are interdisciplinary in nature. The graduates of this programme have a bright future in such interdisciplinary sectors in the automobile, manufacturing, engineering and electronics industries.

Honda, Ether Energy, Schneider Electric, Wabco, GE, John deer, Ford, Anand Automotive Pvt limited, Larson & Toubro, Fiat Chrysler Automobiles, Mahindra & Mahindra, Tetra pek, UCAL fuel systems, KPIT are some of the recent recruiters.

B.Tech. Mechatronics Engineering & B.Tech. Mechatronics Engineering (Specialization in Robotics)

The Department offers B.Tech in Mechatronics Engineering and B.Tech in Mechatronics Engineering with specialization in Robotics. These undergraduate programmes provide students with skills and knowledge on a blend of Mechanical, Electrical, Electronics, Computer Science and Software Engineering. This creates the secondary possibility of catering to the need for engineers in core engineering branches also. The multi-disciplinary curriculum covers most aspects of science, engineering, and technology. Students are given the option of specialising in Robotics.

Core Courses

- Mechanics of Solids and Fluids • Electrical Machines and Actuators • Solid State Devices and Circuits • Electrical and Electronics Laboratory • Fluid power system and Automation
- Kinematics and Dynamics of Rigid Bodies and Mechanism • System Dynamics • Digital Systems and Microprocessors • Linear and Digital Control Systems • Sensors and Signal Conditioning
- Machine Design • Power Electronics and Drives • Microcontrollers and Embedded System
- Manufacturing Processes • Design of Mechatronics System

Elective Courses (B.Tech. in Mechatronics Engineering)

- Elements of Mechatronics Systems • Fundamentals of Robotics • Industrial Instrumentation and Control • Industrial Automation • Manufacturing Information Systems • Industrial Electronics
- Geometric Modelling • Micro Electro Mechanical Systems • Automation and Intelligent Systems
- Virtual Instrumentation • Machine Vision and Image Processing • Advanced Control Systems
- Industrial Programmable Controllers • Special Electrical Machines • Digital Manufacturing
- Process Control Engineering • Applied Mechatronics Systems • Real Time Embedded Systems
- Intelligent Control System • Intelligent Mechatronics Systems • Autonomous Mobile Robotics
- Condition Monitoring Techniques • FPGA Based System Design • Design and Analysis of Algorithms • Advanced Microcontrollers and Signal Processors • Robot Kinematics and Dynamics
- Systems Engineering

Electives (B.Tech in Mechatronics Engineering with Specialization in Robotics)

- Mechanics of Solids and Fluids • Electrical Machines and Actuators • Solid State Devices and Circuits • Electrical and Electronics Laboratory • Fluid power system and Automation



- Kinematics and Dynamics of Rigid Bodies and Mechanism • System Dynamics • Digital Systems and Microprocessors • Linear and Digital Control Systems • Sensors and Signal Conditioning
- Machine Design • Power Electronics and Drives • Microcontrollers and Embedded System
- Manufacturing Processes • Design of Mechatronics System

M.Tech. Mechatronics Engineering

The M.Tech in Mechatronics Engineering programme is a perfect blend of all disciplines which Mechatronics engineering is comprised of, in line with the modern requirements. One of the highlights is that a majority of courses are based on project-based learning philosophy, ensuring that students have access to all the state-of-the-art facilities of the Department.

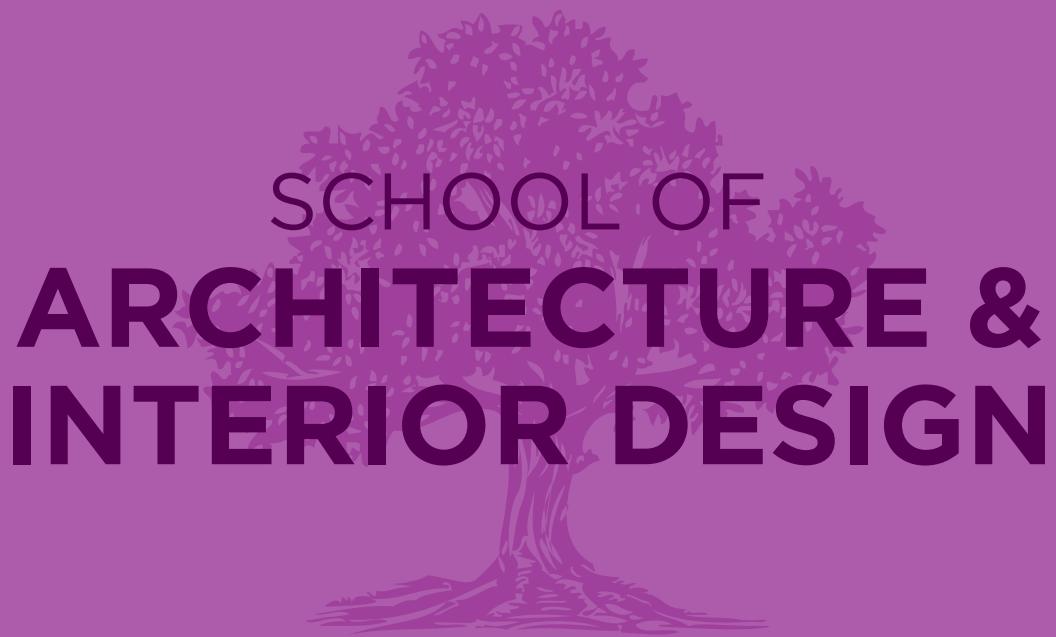
Core Courses

- Computational Mathematics • Concepts in Mechanical Engineering • Concepts in Electrical and Electronics Engineering • Sensors and Data Acquisition • Drives and Actuators • System Dynamics and Control • Microcontrollers and Real Time Systems • Mechatronic System Design

Elective Courses

- Introduction to Robotics • Advanced Robotics • Autonomous Mobile Robotics • Advanced Control Systems • Non-linear Control Systems • System Identification and Intelligent Controllers
- Neural Networks and Deep Learning • Machine Learning • Advanced Microcontrollers and Digital System Design • Algorithms and Parallel Computing • Industrial Automation • Engineering Statistical Analysis • Mechatronics in Manufacturing • Vtronics • Smart Materials and Structures
- Machine Vision • Computer Vision • Robot Vision • Mechatronics and Its Applications • Digital Control System • MEMS and Nano Technology • Metrology and Computer aided Inspection
- Computer Communication and Networks • Object Oriented Programming





- DEPARTMENT OF ARCHITECTURE & INTERIOR DESIGN

DEPARTMENT OF ARCHITECTURE & INTERIOR DESIGN



Undergraduate Programmes

- B.Arch. (Bachelor of Architecture)
- B.Des. (Interior Design)

Postgraduate Programmes

- M.Arch. (Masters in Architecture)
- M.Des

Set up in 1992, The School of Architecture & Interior Design promotes a design philosophy that draws inspiration from the rich cultural heritage of India while simultaneously embracing developments in science and technology, to produce architects of international competence. Its mission is to shape students into architects who will contribute to the socio-economic and cultural development of India and the global community through responsible participation in the process of designing and creating the built environment.

The Department has eminent faculty members, comprising experienced professors, practicing architects, associate professors and assistant professors. Their work is complemented by 10 visiting faculty - eminent architects and engineering professionals who provide much-needed interface with the architectural profession and the building industry.

The Department is equipped with state-of-the-art facilities and is associated with many foreign universities around the world through the Semester Abroad Programme, an initiative which provides students international exposure and global opportunities.

Facilities

The Department is spread over 45,000 sq.ft, with studios, lecture halls, smart classrooms, a display hall, a model-making lab, materials library and a photography lab. The library is well stocked with books, journals and periodicals, as well as e-journals and CDs, on a vast range of topics related to architecture; the computer labs is equipped with advanced hardware and software such as AUTOCAD 2010, Rivet, 3dmax, Adobe photoshop, etc.

The Climatology lab has instruments to analyse climate and its implications on the architectural design process.

The survey lab has a complete set of tools and instruments to understand the surveying methodology and enhance hands-on learning.

Research

A total of five research projects are in progress.

- Experimental learning with comprehensive curriculums
- Highly qualified and professionally dynamic faculty
- Maximum exposure to practical aspects of design
- State-of-the-art infrastructure
- Outcome mapped curriculum
- Wide choice of professional electives in emerging areas
- Regular site visits and workshops

Career Prospects

A career in architecture is creative, lucrative and has a lot of potential in terms of development. Related fields like Interior Designing, Conservation Architecture, Planning, Architectural photography, Architectural Journalism, Graphic Designing, Furniture Designing, Exhibition Designing, Movie Set Designing etc. also offer career avenues.

B.Arch.

Graduates can:

- Join an architectural firm and work on architecture projects.
- Join infrastructure firms as an architect
- Be a freelance architect
- Be a conservationist architect and work to preserve heritage projects
- Be an architecture photographer
- Be an architectural journalist
- Be a graphic designer
- Be an exhibition designer
- Be a movie set designer

B.Des.

Graduates can join interior design firms and work on interior projects.

- Be a freelance Interior Designer
- Be an interiors photographer
- Design movie sets

M.Arch.

Opportunities exist in

- Architecture firms to work on interiors projects
- Infrastructure firms to work as an architect
- Urban Planning
- Freelance field as an architect

B.Arch.

The B.Arch. degree programme at SRM is recognized as one of India's premier courses. The course, of 10-semester duration, is among the most comprehensive programmes in Architecture due to the thrust on contemporary issues such as sustainability, urban re-development etc. and continuous interaction with practicing architects of repute. It also offers a large number of elective studies, ensuring flexibility and choice-based education tailored to the areas of special interest to students, such as urban design, landscape architecture, housing, project management, city planning etc. The programme is approved by the Council of Architecture, New Delhi and was the first one in South India to be accredited by the National Board of Accreditation (AICTE), in 2001.

Core Courses

- Theory of Architecture • Site Planning & Surveying • Interior Design • Environment Sensitive Architecture • Working Drawing • Landscape Architecture Design • Urban Design & Renewal
- Human Settlements & Town Planning • Housing • Estimation & Specification • Comprehensive Viva Voce • Professional Practice • Basic Design & Visual Arts • Architectural Design Studio - I
- Architectural Design Studio - II • Architectural Design Studio - III • Architectural Design Studio - IV • Architectural Design Studio - V • Architectural Design Studio - VI • Architectural Design Studio - VII

Electives Courses

- Temple Architecture • Architecture of South East Asia • Vernacular Architecture & Settlements
- Set Design • Product Design • Architectural Conservation • Universal Design • Behavioural Architecture • Photography and Journalism • Advanced Delineation • Graphic Design
- Large-span Structures for Architectural Applications • Industrial Building System • Structures and Services in High-Rise Buildings • Parametric Modelling (Grasshopper, Rhino) • Building Information Modelling (Revit) • 3D Rendering and Presentation (Max & Lumion, Vray) • Furniture Design Studio • Applied Art Studio • Interior Detailing Studio

B.Des.

The B.Des Interior Design programme of 8-semester duration deals with design and decoration of rooms, buildings and built environment in general. It also covers topics like furniture design, interior landscape etc. Students will be able to gain both theoretical and practical knowledge and are trained to carry out design processes as a part of a team as well as independently. Their understanding of the domain of design is demonstrated through measurable learning outcomes



during the programme. Students develop critical and analytical abilities together with educational values that contribute to a lifelong learning attitude..

Core Courses

- Basic Design Studio • Freehand and Digital Delineation • Evolution of Interiors - Classical
- Interior Design Studio - 1 (Residential) • History of Interiors - Contemporary • Theory of Interior Design • Interior Design Studio - 2 (Retail) • Digital 2D Drafting • Sustainability in Interiors
- Interior Design Studio-3 (Large Commercial) • Digital 3d Modelling • Interior Design Studio - 4 (Cultural) • Interior Design Studio - 5 (Hospitality) • Professional Practice • Interior Landscape

Electives Courses

- Set Design • Product Design • Textile Design • Photography and Journalism • Advanced Delineation • Portfolio Making • Parametric Modelling (Grasshopper, Rhino) • Building Information Modelling (Revit) • 3D Rendering and Presentation (Max & Lumion, Vray) • Cultural Expression in Interior Design • Traditional Arts and Crafts of India • Adaptive Reuse • Biomimicry in Interior Design • New-Age Materials • Green Interiors

M.Arch.

The 4-semester M.Arch (Architectural Design) degree is one of the most innovative programmes in India, and it prepares graduates to meet the challenges thrown up by the ever-changing needs of contemporary society. It is structured to educate those who aspire to create masterpieces of complex architecture, including largescale infrastructure projects and metro-level urban facilities. It aims to train scholars specifically in the design and construction of tall buildings, airports, mass rapid transportation terminals, stadiums and environmental planning projects for large areas.

Core Courses

- Urban Design • Large-span Structures for Architectural Applications • Standards & Legal Framework for Urban Infrastructure Projects • Advanced Computer Studio • Design Studio-I (Urban Design) • Structure and Services in High-Rise Buildings • Contemporary Processes in Architecture • Design Studio - II (Urban Infrastructure Projects) • New Urbanism • Urban Landscape • Performance Evaluation Tools for Sustainable Buildings • Design Studio - III (High-Rise Buildings)

Electives Courses

- Sustainable Development • Green Building Strategies for Tall Buildings • Disaster Management
- Environmental Strategies • New-Age Materials and Construction • Facade Technologies for Buildings

M.TECH

BY RESEARCH

M.Tech by Research is a 2-year post graduate programme with more emphasis on research / extended projects rather than course work. MS students will be assigned a professor or can select a professor of their interest to work in his/her lab with other research students. Each MS student must submit a thesis on the research work carried out characterised by either discovery of new facts, new interpretation of known facts and theories, an independent design, development of a new instrument or technology, optimisation of industrial process parameters, an exhaustive study and criticism of published work, or any applied research work that can be exploited for betterment of the society.

Minimum qualification required for admission is B.E / B. Tech / MCA / M.Sc or equivalent in relevant discipline with an aggregate of 60% marks or its equivalent grade. While computing the percentage of marks (or CGPA), the marks obtained in all courses prescribed for the award of the qualifying programme will be considered.

Admission Procedure will be on the lines of PhD

Structure of Programme The coursework may be chosen from the existing postgraduate M.Tech. programmes of the department or from those of other departments. If a suitable course is not available, the programme co-ordinations can frame a course with the help of experts and get it approved by the academic council. The student of M.Tech. (Research) programme must register not more than 20 credits per semester (except in final semester). The minimum credit requirement for the award of M.Tech (Research) programme is 80 credits.

M.Tech. (Research) students enrolled in postgraduate courses are subjected to the same regulations as applicable to other students in the courses with regard to attendance, discipline,



and assessment and grading. One credit course on Seminar and Technical Writing (STW) is compulsory for all the students in every semester, where the students shall learn and practice essential writing and presentation skills, and attend seminars by reputed engineers and Scientists organized by the Departments.

Evaluation of the course on Seminar & Technical Writing and award of grades will be done by MSC based on the following four components:

- (a).Attendance in seminars / conferences (at least four) and written report(s) on the contents learnt.
- (b).Term paper based on literature review and analytical work.
- (c).Poster on a topic with rich graphic components.
- (d).Patent search (at least one) and summary of at least two related patents.
- (e).The submitted documents (the best ones) will be archived for study by future students.

Every semester, the M.Tech (Research) students shall submit semester progress report of the previous semester within a week of the start of the semester. In the second semester, on completion of coursework, the student should register for comprehensive viva voce, STW and research credits.

Doctoral Programmes (Ph.D.)

There are three categories of Ph.D. candidates:

- i. Full-Time candidates: All candidates who pursue full-time research in SRMIST
- ii. Part-Time (Internal) candidates: All candidates employed in SRMIST who pursue part-time research in SRMIST
- iii. Part-Time (External) candidates: All candidates working in industrial units, colleges, government departments, research organisations or other institutions, sponsored for pursuing Ph.D. programmes in SRMIST while continuing to serve their respective institutions/organisations which are recognised as research centres of SRMIST (They will pursue research in their place of employment and/or in SRMIST)

Duration

Full-time Programme: Min 3 years - Max 5 years (including course work)

Part-time Programme: Min 3 years - Max 6 years (including course work)

The duration of the programme and the time for submission of the thesis are calculated from the date of provisional registration.

Women candidates and persons with disability (more than 40% disability) may be allowed a relaxation of two years. In addition, women are eligible for maternity leave/child-care leave of up to 240 days once during the Ph.D time-frame.

Part-time (Internal/External): The part-time Ph.D. programme can be undertaken provided all the conditions mentioned in the extant Ph.D. regulations are met.

ELIGIBILITY FOR B.TECH PROGRAMMES

Minimum 50% aggregate in PCM

- i. Passed Higher Secondary examination (10+2 pattern) or appearing in Higher Secondary examination in the current academic year with Physics, Chemistry and Mathematics as major subjects in regular stream from any state board within India, CBSE, ISCE, Matriculation, or NIOS
- Note: Students who have completed +2 under NIOS must have completed the 10th standard from regular schooling or vice-versa.
- ii. GCE A-level or International Baccalaureate (IB) diploma or IB certificate with Physics, Chemistry and Mathematics as major subjects (equivalent to Advanced Placement level in each subject) in any International school within India

B.Tech

- i. Biotechnology
 - ii. Biotechnology with specialization in Genetic Engineering
 - iii. Biotechnology with specialization in Regenerative Medicine
 - iv. Electronics and Communication with specialization in Biomedical Engineering
- Minimum 50% aggregate in PCM / PCB**

- i. Passed in Higher Secondary examination (10+2 pattern) or appearing in Higher Secondary examination in the current academic year with Physics, Chemistry and Mathematics or Biology or Biotechnology as major subjects in regular stream from any state board within India, CBSE, ISCE, Matriculation, or NIOS
- ii. GCE A-level or International Baccalaureate(IB) diploma or IB certificate with Physics, Chemistry, Mathematics or Biology as major

subjects (equivalent to Advanced Placement level in each subject) in any International schools within India

Note: Only those candidates who have passed the above qualifying examination in not more than 2 attempts including appearance for improvement will be considered for admission

Candidates desirous of joining B.Tech Electronics and Communication with specialisation in Biomedical Engineering who have not studied Mathematics as a subject at the +2 level examinations have to do a bridge course in Mathematics after taking admission to the 1st year of the B.Tech course.

SRMJEEE (UG) 2020

Candidates who have attempted Physics, Chemistry, Mathematics, English & Aptitude in SRMJEEE(UG) are eligible for all the B.Tech Degree Programmes

Candidates who have attempted Physics, Chemistry, Biology, English & Aptitude in SRMJEEE (UG) are eligible for B.Tech. Biotechnology and all its specializations and B.Tech Biomedical Engineering.

Direct Admission

To encourage and support students of exceptional talent, SRM Institute of Science and Technology (formerly known as SRM University) offers direct admission and scholarships to students securing the first rank in the central and state boards in India, top 10,000 rankers in IIT JEE, top rankers in each district of Tamil Nadu and exceptional sports persons at National and International level.

ELIGIBILITY FOR M.TECH PROGRAMMES

Specialization	Eligibility (A basic degree or equivalent in the following with a minimum aggregate of 50%)
M.Tech by Research (All Programmes)	Candidates can register for any of the specialization below with the following eligibility.
Automotive Hybrid Systems Engineering	B.E / B.Tech in Mechanical / Automobile/ Aeronautical / Mechatronics/ Production / Electrical / ECE / EEE / Electronics / Instrumentation & Control Engg with aggregate & final year score over 50%. GATE Score and / or work experience in related area is preferred. Selection through entrance and interview. Equal Proportion to both streams of Mechanical and Electrical Engineering will be considered in selection.
Big Data Analytics	B.E / B.Tech. in CSE / IT / SWE (or) M.Sc. (CSE / IT) (or) MCA (or) its equivalent.
Biomedical Engineering	B.E / B.Tech in Biomedical Engineering / Biomedical & Instrumentation Engineering / ICE / EIE / Biotechnology / Nanotechnology / Medical Electronics (or) M.Sc.(Electronics / Medical Electronical / Applied Electronics) (or) M.Sc.(Physics / Medical Physics / Bio-Physics) (or) M.Sc. (Bio-informatics / Biomedical Informatics / Biotechnology) (or) MBBS / BPT / BOT (or) its equivalent.
Biotechnology	B.E / B.Tech. in Chemical Engineering / Bio-Technology / Bio-Chemical Engineering / Genetic Engg. / Bioinformatics / Biomedical Engg. / Biomedical & Instrumentation Engg. / Bioprocess Engg. / Food Process Engineering (or) B.Pharm (or) M.Sc. (in any branch of Life Sciences / Biotechnology) (or) its equivalent.
Chemical Engineering	B.E / B.Tech. in Chemical Engineering / Electrochemical Engg. / Petrochemical Engg (or) its equivalent
Cloud Computing	B.E / B.Tech in CSE / IT / SWE / ECE / EEE / EI (or) MCA (or) M.Sc (CSE / IT) (or) its equivalent.
Computer Aided Design	B.E / B.Tech. in Mechanical Engg. / Production Engg. / Automobile Engg. / Aerospace / Aeronautical Engg (or) AMIE (Mech) / AMAeSI (Aero) / IMechE. (or) any equivalent degree in the above Disciplines.
Computer Integrated Manufacturing	B.E / B.Tech. in Mechanical Engg. / Production Engg. / Industrial Engg. / Automobile Engg. / Metallurgical / Metallurgy Engg. / Aerospace / Aeronautical Engg. / Mechatronics Engg. (or) AMIE (Mech) / AMAeSI (Aero) / IMechE (or) any equivalent degree in the above Disciplines
Computer Science & Engineering	B.E / B.Tech. in CSE / IT / SWE / ECE / EEE / EIE & ICE (or) MCA (or) M.Sc. (CS / CST / IT / SW) (or) its equivalent.

Specialization	Eligibility (A basic degree or equivalent in the following with a minimum aggregate of 50%)
Construction Engineering and Management	B.E / B.Tech. in Civil / Civil Infrastructure Engg. / Architectural Engg. (or) B.Arch. (or) its equivalent.
Electronics & Control Engineering	B.E / B.Tech. in ECE / ICE / EEE / EIE (or) its equivalent.
Embedded System Technology	B.E / B.Tech. in EEE / ECE / CSE / IT / ICE / EIE (or) M.Sc. (Electronics / Applied Electronics) (or) M.Sc. (Physics - Special Electronics) (or) its equivalent
Environmental Engineering	B.E. / B.Tech (Civil / Civil Infrastructure / Architecture Engg. / Chemical / Biotechnology), or M.Sc (Environmental Science / Ecology / Environmental Ecology / Environmental Chemistry) (or) its equivalent
Food and Nutritional Biotechnology	B.E / B.Tech. in Food Process / Chemical / Biotechnology / Agricultural Engineering/ Food Processing and Preservation Technology/ Food Technology (or) its equivalent.
Food Safety and Quality Management	B.E / B.Tech in Food Engineering / Agricultural Engineering / Diary Technology / Biotechnology / Chemical Engineering (or) M.Sc in Food Science / any branch of Life Sciences / Home Science / Nutrition & Dietetics (or) its equivalent.
Genetic Engineering	B.E / B.Tech in Genetic Engineering / Biotechnology / Industrial or Medical or General or Food Biotechnology / Biochemical Engineering / Bioinformatics / Bioprocess Engineering (or) B.Pharm (or) B.V.Sc. (or) B.F.Sc. (or) B.Sc. (Agri) / B.Sc. (Forestry) (or) MBBS (or) M.Sc in any branch of Life Sciences (or) its equivalent
Geo Technical Engineering	B.E / B.Tech. (Civil / Civil Infrastructure / Architecture Engg. / Geo Informatics / Structural Engg.) or M.Sc. (Geology / Applied Geology / Geophysics with Maths background) (or) its equivalent.
Information Security and Cyber Forensics	B.E / B.Tech. in CSE / IT / SWE (or) M.Sc. (CSE / IT) (or) MCA (or) its equivalent.
Internet of Things	B.E / B.Tech. in CSE / IT / SWE / ECE / EEE / ETE / Mechatronics / EIE & ICE (or) MCA (or) M.Sc. (CS / CST / IT / SW / Electronics / Applied Electronics) (or) any equivalent degree in the above Disciplines
Mechatronics Engineering	B.E / B.Tech in Mechanical Engineering, Production Engineering, Manufacturing Engineering, Automobile Engineering, Aerospace Engineering, Mechatronics Engineering, Electrical and Electronics Engineering, Electronics & Communication Engineering, Instrumentation and Control Engineering, Electronics & Instrumentation Engineering, Electronics & Instrumentation Engineering, Computer Science Engineering, Information Technology, Software Engineering (or) its equivalent.
Mobile and Pervasive Computing	B.E / B.Tech. in CSE / IT / SWE / ECE / EEE / ETE/ EIE & ICE (or) MCA (or) M.Sc. (CS / CST / IT / SW) (or) its equivalent

Specialization	Eligibility (A basic degree or equivalent in the following with a minimum aggregate of 50%)
Nanotechnology	B.E / B.Tech. (Any Specialization), M.Sc (Physics / Materials Science / Chemistry / Applied Chemistry / Bio Chemistry / Biotechnology) with mathematics as one of the subjects at B.Sc level (or) its equivalent
Power Electronics and Drives	B.E / B.Tech. in EEE / ECE / ICE / EIE (or) its equivalent
Power Systems	B.E / B.Tech. in EEE (or) its equivalent
Remote Sensing and GIS	B.E. / B.Tech (Civil / Civil Infrastructure / Architectural Engg. / Geo Informatics / CSE / ECE / EEE / IT / Agricultural Engg / Urban & Regional Planning) or B.Sc. (4 years) - Agriculture / Forestry / Horticulture / Geography or M.Sc. / M.A (Geology / Applied Geology / Geo Physics / Geography / Geo Informatics / Physics / Maths / Oceanography / Environmental Science) (or) its equivalent
Robotics	B.E / B.Tech. in Mechanical Engg. / Production Engg. / Industrial Engg. / Automobile Engg. / Aerospace / Aeronautical Engg. / Mechatronics Engg. / ECE / EEE / ICE / CSE (or) AMIE (Mech) / AMAeSI(Aero) / IMechE (or) any equivalent degree in the above Disciplines
Solar Energy	B.E. / B.Tech. in Mechanical Engineering / Automobile Engineering / Chemical Engineering / Electrical & Electronics Engineering / AMIE (Mechanical Engineering) / AMAeSI / IMechE / M.Sc.(Physics) (or) any equivalent degree in the above discipline
Structural Engineering	B.E / B.Tech. in Civil / Civil Infrastructure Engg. / Architectural Engg. (or) its equivalent.
Telecommunication Networks	B.E / B.Tech. in ECE / ETE / TE (or) its equivalent
VLSI Design	B.E / B.Tech. in ECE / EEE / EIE / CSE / IT (or) M.Sc. (Electronics / Applied Electronics) (or) M.Sc. (Physics - Special Electronics) (or) its equivalent.
Wireless and Mobile Communication System	B.E / B.Tech. in ECE / ETE / TE (or) its equivalent.

Eligibility for M. Arch - Master of Architecture (Duration: 2 Years)

B.Arch. (or) equivalent

Specialization	Eligibility for Diploma & Post Graduate Diploma Programmes
PG Diploma in Advanced Life Science Technology	M.Sc or M.Tech in life sciences / M.V.Sc. PG final year students can also apply.

AGRICULTURAL SCIENCES | ENGINEERING & TECHNOLOGY
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SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

Kattankulathur - 603 203. Chengalpattu Dist. Tamil Nadu, India

Tel: +91 44 2745 5510, 4743 7500

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