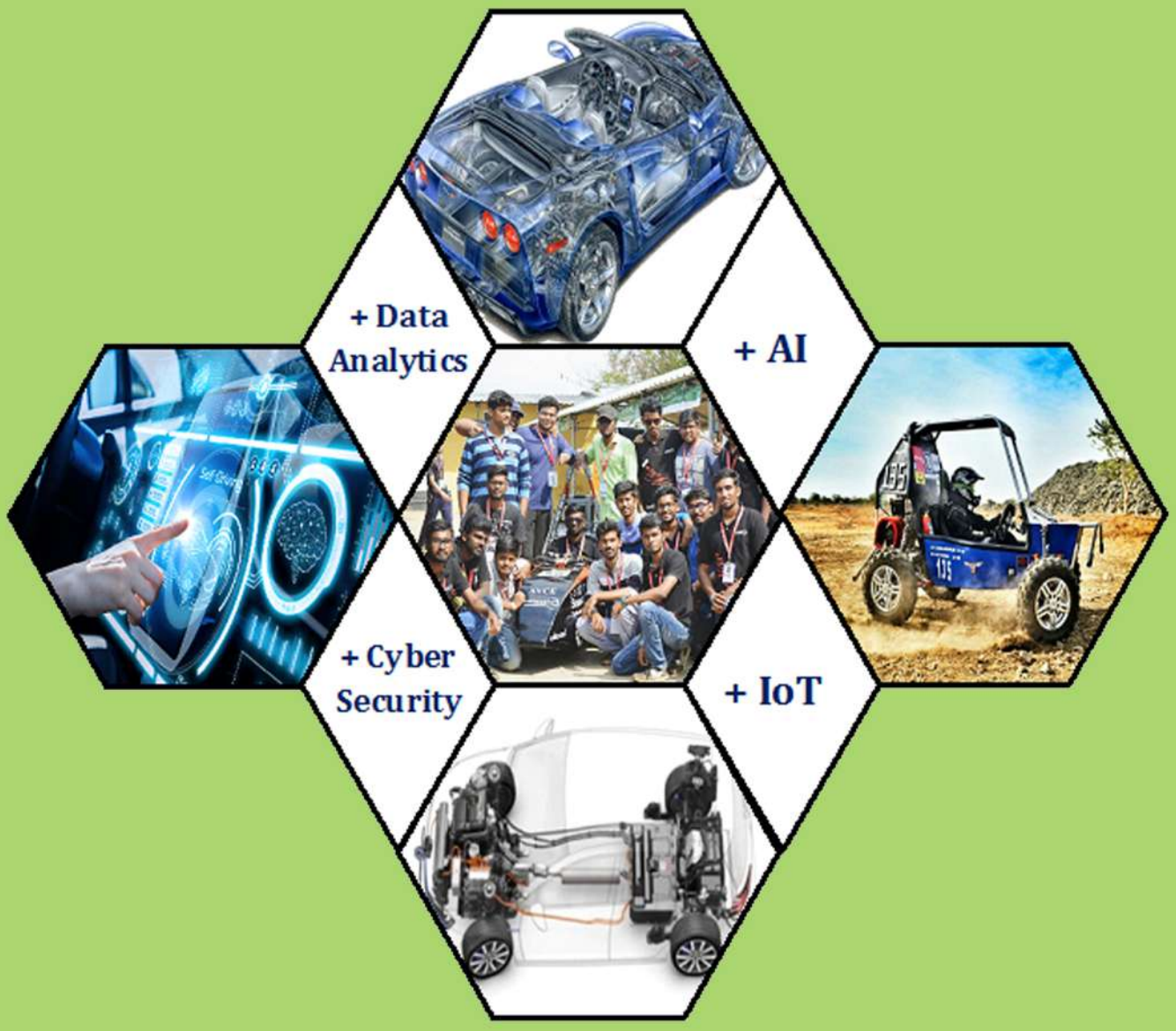
B.E. Automobile Engineering

(with a special focus on Hybrid and Electric Vehicles)



Department of Automobile Engineering
Sri Venkateswara College of Engineering
(Autonomous - Affiliated to Anna University)
Pennalur, Sriperumbudur Taluk - 602 117

why
Engineering

The exponential technological advancements in the fields such as electronics, medicine, transportation, energy, smart materials etc., always have an ever-increasing requirement for engineers. Engineers make a great deal of contribution to the world at large through their crucial role in making scientific and technological progress. They inevitably reap a rewarding experience by being creators, developers, managers of intricacies in technological breakthrough.

why
Automobile Engineering

Automobile Engineering course prepares one for a worthwhile career in the ever-growing automotive sector complimented with a wide range of opportunities for research. The course is for those who aspire to excel in automotive engineering and to acquire expertise in automotive technology. It equips one to innovate, ideate, and to redefine the challenges of the industry. With the latest development of Hybrid and Electric Vehicles, students get to explore inevitable possibilities of R&D in the new areas.

Employment Opportunities

Automobile Engineers certainly have a progressive future as the industry aims to shift massively from the conventional automotive to the next generation hybrid & electric cars and self-driving vehicles. The environmental constraints to cut down CO2 emissions etc., make the industry want new products, systems, method of manufacturing to process their way to success in the market. They need creative engineers to make next generation vehicles. Therefore, the industry is completely aware that it is going to be the present generation automobile engineers with an additional knowledge on Machine Learning (ML) and Artificial Intelligence (AI) who will bring a reformed and refined future transportation.

Automobile Engineers find their employment primarily in product design and they are sought after for the same by a variety of automotive firms. Career opportunities for automobile engineers are widely spread over the countries like USA, Germany, United Kingdom, Japan, Republic of Korea, etc. With Indian Government's 'Automotive Mission Plan' (AMP)-II-2016-26, one can expect a plethora of job opportunities in this industry. Top companies that can recruit Automobile Engineers are: Tata Motors, Mahindra & Mahindra Ltd, Maruti Suzuki, TAFE, TVS, Eicher, Hero MotoCorp Ltd, Bajaj Auto Ltd., Toyota Motor Corporation, Chevrolet, Mitsubishi Motors Corporation, Honda Motor Co Ltd., Ford Motor Company, L & T, Ashok Leyland, Heldex India, Yamaha, Hyundai, Volkswagen, Audi, Renault Nissan, Royal Enfield, Bosch, Continental, Delphi, Benz, Magneti Marelli, Behr, Hella, Chrysler, Vespa, etc. Besides these, there are number of IT companies and small-scale industries taking up automobile engineers such as CTS, INFOSYS, WIPRO, TCS, KPIT, etc.



why
Automobile Engineering *at* SVCE

Firstly, the College is an ISO 9001:2015 certified institution and is accredited by National Assessment and Accreditation Council (NAAC). Also, SVCE offers the management scholarship on the basis of Merit Means, Merit-cum-Means, Economic Means, Performance in Sports and Performance in NCC activities.

The Department was started in the year 1999 and is accredited by the National Board of Accreditation (NBA) since 2006. The four-year course on Automobile Engineering at SVCE exposes students to all the relevant principles of engineering studies and provides unparalleled practical experience on automotive technology, production methods, design and function, and management techniques. The teaching and learning happen at premises that are exclusively built to serve the purpose. Practical exposure in the well-equipped laboratories widens the students' learning horizon for deeper knowledge on automotive design. The faculty and staff with exceptional knowledge share their profound expertise in their fields which helps students to gain not only academic perspectives but also professional exposure that prepares them for a fulfilling career.

Through autonomy, the course has been well framed with a collective input from the members of Board of Studies that comprises academicians, industrial experts, advisors from universities of repute. Through such a supportive educational environment at SVCE, students invariably excel in their academic pursuit and become engineers who are highly sought after by the industries. With a special focus on Hybrid and Electric Vehicles, students get to explore inevitable possibilities of R&D in the sector.



Additional Skills *provided to students*

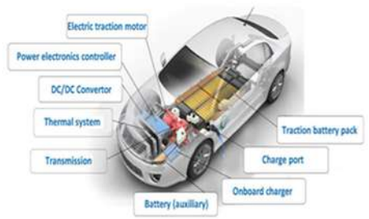
Students get to gain a profound understanding of the advancements in zero-carbon and sustainable systems and the future technologies of automotive manufacturing. Furthermore, they get to constantly have an interaction with experts in the automobile education and prospective employers from the industry. The institute's collaboration with the industry influences the way of teaching & learning experiences and research activities. Hands-on-training is offered to the students in the emerging areas like IoT, Artificial Intelligence, Machine Learning, Electric and Hybrid Vehicles, Data Analytics, OOPS, etc. Students are given exposure in Autonomous vehicles and advanced software like MATLAB, PYTHON, etc.

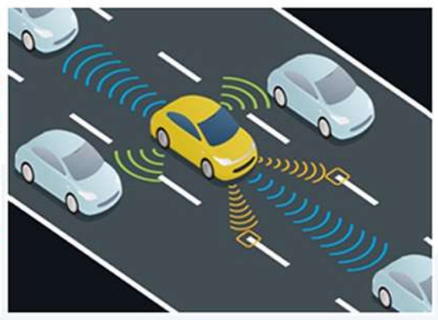
The government has formulated a scheme for Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) in India, under the National Electric Mobility Mission 2020, to encourage the progressive introduction of reliable, affordable, and efficient electric and hybrid vehicles into the country. In view of making the students to fulfil the current needs of industries and increasing the employment opportunities, special training is being provided to design and develop Electric & Hybrid Vehicles of various ranges, to design and analyze EV motors, to design and develop Electric Vehicle (EV) converters, to select EV battery and Battery Management System (BMS), etc.

The course additionally covers areas such as Automotive Engine Testing, Automotive Electrical and Electronics, Modelling and Analysis of Automotive Components, Simulation of Automotive Components, Testing of Fuels and Lubricants, Two and Three Wheeler Servicing, Vehicle Maintenance and Testing.

The purpose-designed well equipped laboratories have remarkable facilities such as

- AVL Indimodule System
- AVL Smoke Meter & AVL Five Gas Analyzer
- Automotive Multi-cylinder SI Engines and CI Engines with Eddy Current Dynamometer, Piezoelectric Pick up & Angle Encoder
- Chassis Dynamometer - Two/Three/Four Wheeler
- Computerized Shock Absorber Test Rig
- Computerized Wheel Aligner
- Diesel Engine for Dismantling and Assembling - Endura, Tata, Ashok Leyland
- Engine Analyzer
- Fuel Injection Pump Calibration Test Bench
- Hybrid and Electric Vehicle
- Petrol Engine for Dismantling and Assembling - Hyundai Santro, Nissan, Maruti, Ambassador
- Software: Adams R3, Ansys 12.0, AutoCAD 2016, CADEM, Creo4.0, Star CD, MATLAB, etc.





Higher Studies

The quality of education determines the quality of career success. A master's degree in automobile engineering would be an ultimate kick-start for a renowned career. An ambitious student will only aim for a never-ending holistic learning experience. At SVCE, students are provided with supportive training pertaining to their future plans for doing a master's. The four-year course provides a world-wide recognized bachelor's degree, with appropriate industrial training experience.

Our students pursue their master's in the field of Engineering and Technology and also in Business Administration and Management in reputed Universities worldwide including Clemson University-USA, Wisconsin Madisson University-USA, RWTH Aachen University-Germany, Inglostadt University-Germany, University of Sheffield-UK, Oxford Brookes University-UK, etc.

Companies Visited/ Visiting SVCE

Reputed core companies like Ashok Leyland, Brakes India, DELPHI-TVS, Hinduja Tech Limited, Hyundai Mobis, Hyundai Motor India Ltd, Komatsu India Pvt Ltd., L&T-ECC, Mu-Sigma, NSK Bearing, Renault Nissan, Royal Enfield, SAME Deutz-Fahr, TAFE, TATA AIG, etc. have visited and have been visiting our College to recruit Automobile Engineering students. Software companies like Accenture, CTS, Ford Technologies, Zoho, HCL Technologies, INFOSYS, L&T InfoTech, WIPRO, etc. also visited and continue to visit for campus recruitment.

Co-Curricular Activities

Automobile Engineering has become an interdisciplinary subject that harnesses its network with other engineering fields such as Mechanical, Electrical, Electronic, Safety and Software Engineering. Pursuing research programs with such integrated aids from other engineering programs helps to conceptualize new driving machines with impressive functionality, assured safety and grand aesthetics. And therefore, to promote research activities and to encourage students, financial support is provided by the management for students to participate in technical paper presentation in conferences at the International level.

In-Plant Training

Students have undergone In-Plant Training in various leading industries including:

- Accenture
- Ashok Leyland
- Brakes India
- CTS
- DELPHI TVS
- Ford
- Freshworks
- Hinduja Tech Ltd
- Hyundai Motors
- Komatsu India
- Mobis
- Rane
- Renault Nissan
- Royal Enfield
- Simpson & Co
- TAFE
- TATA Motors
- Tube Products of India
- TVS
- UCAL Fuel Systems
- Valeo
- Volkswagen
- Volvo
- Wabco India Ltd

AAE Activities

- The Association of Automobile Engineers (AAE) was instituted in 2002, primarily to conduct technical symposiums and guest lectures. Beyond academics, in-plant training and industrial tours are also organized through the association.

- TRAXION, a National Level Technical Symposium conducted annually by the students of Automobile Engineering. It attracts, more than 200 students from various colleges participate in the event. Events like Auto Expo, RC Rage, Auto Quiz, Paper Presentation, etc. connect students with their ambitious peers and inspire one another. Students' participation in National level competitions in Design and Fabrication of racing car like GO KART and FORMULA BHARAT brings laurel to their academic as well as professional profile.

SAE Activities

SAE Collegiate Club of SVCE is one of the most active Clubs of SAEINDIA Southern section. The members of SAE participate in events like Trek, Industrial Visits, Lectures, Workshops and Student convention every year. Students of Automobile Engineering participate in BAJA SAEINDIA and SUPRA SAEINDIA competitions conducted every year.

Automotive Research Cell (ARC)

Many research and consultancy works are being carried out using modern facilities available in the department and the on-going investigations are:

- Performance, emission, and combustion analysis of stationary engine fueled with Diesel, Biodiesel, etc. with engine modifications
- Performance, emission, and combustion analysis of automotive CI engine
- Performance and emission analysis of automotive SI engine
- Durability test of stationary and automotive engines
- Durability test of components of automotive engines
- Testing of automotive engine radiators with different coolants
- Testing of Two/Three/Four wheelers including electric & hybrid vehicles using Chassis Dynamometer

Curriculum

Choice Based Credit System of curriculum allows the students to choose what and when do they want to learn courses. This enables them to learn at their own pace and ensures academic success naturally. The curriculum of Automobile Engineering includes various subjects in the field of Automotive Core like Automotive Engines, Automotive Vehicles including Hybrid and Electric, Battery Technology, Design, Electrical and Electronics, Artificial Intelligence, Data Analytics, Management, Manufacturing and Thermal.

Humanities and Social Sciences

- Communicative English
- Interview and Career Skills Laboratory
- Technical English

Basic Science

- Engineering Chemistry
- Engineering Materials
- Engineering Mathematics I
- Engineering Mathematics II
- Engineering Physics
- Environmental Science and Engineering
- Partial Differential Equations and Computational Methods
- Physics and Chemistry Laboratory

Engineering Science

- Applied Mechanics
- Basic Electrical and Electronics Engineering
- CAD/CAM Laboratory
- Computer Aided Drafting Laboratory
- Engineering Drawing
- Engineering Practices Laboratory
- Human Relations, Values and Ethics
- Manufacturing Technology and Systems
- Manufacturing Technology Laboratory
- Mechanics of Machines
- Production Processes
- Programming for Problem Solving
- Programming for Problem Solving Laboratory

Professional Core

- Automotive Chassis
- Automotive Components Design
- Automotive Components Laboratory
- Automotive Electrical, Electronics and Microcontroller Laboratory
- Automotive Electrical, Electronics and Microcontroller Systems
- Automotive Engines
- Automotive Fuels and Lubricants
- Automotive Fuels and Lubricants Laboratory
- Automotive Transmission
- Basic and Applied Thermodynamics
- Battery and Fuel Cell Technology for Electric Vehicles
- Design of Machine Elements and Transmission Systems
- Engine Performance and Emission Testing Laboratory
- Fluid Mechanics and Hydraulic Machines
- Fluid Mechanics and Machinery Laboratory
- Hybrid and Electric Vehicles
- Mobility Engineering Management
- Motors and Controls for Hybrid and Electric Vehicles
- Simulation of Engine and Chassis Components Laboratory
- Strength of Materials
- Strength of Materials Laboratory
- Thermal Engineering and Heat Transfer
- Vehicle Design Data Characteristics
- Vehicle Dynamics
- Vehicle Maintenance
- Vehicle Simulation Laboratory
- Vehicle Testing and Maintenance Laboratory

Professional Elective

- Additive Manufacturing
- Advanced Theory of IC Engines
- Advanced Vehicle Technology
- Alternative Fuels and Energy Systems
- Artificial Intelligence for Automotive Applications
- Artificial Intelligence and Robotics
- Automotive Aerodynamics
- Automotive Air Conditioning
- Automotive Automation
- Automotive Control System for Driveline
- Automotive Noise, Vibration and Harshness
- Automotive Pollution and Control
- Automotive Safety and Ergonomics
- Composite Materials and Mechanics
- Computational Fluid Dynamics
- Corporate Finance
- Design of Experiments
- Embedded Systems for Automotive Applications
- Engine and Vehicle Management Systems
- Financial Statement Analysis
- Finite Element Analysis for Automobile
- Fundamentals of Nano Science and Technology
- Hydraulics and Pneumatics Systems
- Industrial Robotics
- Intellectual Property Rights
- Managerial Economics
- Manufacturing of Automotive Components
- Market Research
- Off Highway Vehicles
- Operations Research
- Principles of Management
- Production Management
- Project Management
- Securities Market - Beginner's Module
- Simulation of IC Engines
- Supply Chain Management
- Total Quality Management
- Two and Three Wheeler Technology
- Vehicle Body Engineering
- Vehicle Multiplexing
- Virtual Instrumentation in Automobile Engineering

Value Added Courses

- Basics of Entrepreneurship Development
- Basics of ML Algorithms for Automotive Industries
- Communicative German
- Communicative Hindi
- Communicative Japanese
- Design Thinking and Prototyping Laboratory
- Hands on Programming with R
- Introduction to Internet of Things and Cloud Computing for Automobile Engineers
- Object Oriented Programming Concepts
- Recommender Systems for Automotive Industries
- Statistics for Engineers

Mandatory Course

- Indian Constitution and Society

Open Elective

Students can choose emerging subjects such as Basics on Cyber Security and Ethical Hacking, Introduction to Internet of Things, Python Programming, Database Systems and Applications, Introduction to Cloud and Big Data Analytics, Multimedia and Animation Techniques, Internet of Everything, Foundation on Mobile App Development, Embedded and Real Time Systems, AI for Android, Industrial Automation, etc., as their open electives offered by other departments.

Department of Automobile Engineering

Contact Us

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Vision

To be a forerunner in producing Competent and Responsible Engineers in the field of Automobile and Associated areas to meet the ever-changing needs of the Global Automotive Industry and the Society.

Mission

Vision achieved by,

1. Providing the state-of-the-art laboratory facilities to train the learners to cater to the changing needs of the industries and the society.
2. Providing opportunities for the learners to bring out their total personality and emphasizing ethical values.
3. Preparing the learners to meet the growing challenges of the automotive industry and to fulfill the diverse societal needs of our nation.
4. Providing research and intellectual resources to address contemporary and complex problems of the industries and to advance interdisciplinary research and applications.
5. Providing compassionate and diverse environment to encourage the students to become innovators and job providers.

Program Educational Objectives

PEO1: To apply technical and professional skills in Automobile Engineering to meet the demanding and growing challenges of the industries.

PEO2: To apply professional and interpersonal skills by continuously focusing on learning towards higher education and research.

PEO3: To direct learners to become successful entrepreneurs by inculcating professionalism, responsibility, and ethics.

Program Specific Outcome

PSO1: Apply the concepts of theory of automotive powertrain and to design and develop the modern engines, transmission systems and alternative propulsion system.

PSO2: Apply the concepts of various subsystems to design and analyze the performance of brakes, suspension, steering and electrical/electronic components.