K. S. R. COLLEGE OF ENGINEERING

An Autonomous Institution

(Approved by AICTE, New Delhi, Affiliated to Anna University)

K.S.R. Kalvi Nagar, Tiruchengode – 637 215,

Namakkal District, Tamil Nadu

DEPARTMENT OF AUTOMOBILE ENGINEERING

AUTOEVON-2024

TECHNICAL MAGAZINE

ACADEMIC YEAR 2024-2025

Vision, Mission of Institution

Vision:

- The department aims to develop professionals having good knowledge, skills and attitude in the field of computer applications for the betterment of industry and society.

Mission:

- To provide high quality education in the field of computer applications and there by create compute professionals with proper leadership skills, commitment and moral values.
- To educate students to be successful, ethical, and effective problem-solvers and life-long learners who will contribute positively to the economic well- being of our nation

Vision, Mission of Department

Vision

- Education and research to meet the need of global automotive industry and society.

Mission

- Quality education through flexible curriculum, research and self-learning.
- Training via automotive industry for a sustainable society and social development.

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Message from Chairman

Thiru R. Srinivasan BBM., MISTE.,

Chairman,
KSR Educational Institutions

Education is the foundation of a brighter tomorrow, and this magazine reflects the vibrant spirit of our learners. May it continue to inspire creativity, excellence, and lifelong curiosity in every reader. In the recent times, the role of KSRCE is to carry out proactive research and development activities to make the students as well as faculty member's intellectuals, which are very challenging and demanding. It is of great significance that this magazine is going to deliberate upon It will definitely explore new areas of practice and enhancing quality of professional services. I am sure this magazine will be a milestone in ensuring the highest standards in this profession. I wish the organizers the very best in this and all their other endeavors. I am eagerly looking forward to seeing you and enjoying this magazine in KSRCE Campus.

With best wishes

Mr. R. Srinivasan

Chairman

KSR Educational Institutions

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Message from Principal

Dr. P. Meenakshi Devi
Principal – KSRCE

It is with immense pride and joy that I present to you the latest edition of our BME Department magazine a vibrant reflection of the creativity, talent, and achievements of our students and staff. Over the past one decade, KSRCE has served the young engineering aspirants of our nation by providing state-of-art facilities and well knowledgeable faculty members. The Institute has held high the lighted torch of teaching and learning and has not failed in its duty in the hour of need. The students imbibe qualities of an excellent teacher and researcher to set academic standards. The last couple of years marked several milestones in the history of KSRCE. Technology is constantly evolving, and staying up to date with the latest trends can help us stay competitive in the job market, give you access to new features and capabilities. I congratulate the editorial team, contributors, and all those who have worked tirelessly to bring this edition to life. Let this magazine serve not only as a record of our accomplishments but also as an inspiration for the journeys yet to come.

With best wishes

Dr. P. Meenakshi Devi
Principal
KSRCE

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Message from Head of the Department

Dr. R. VENKATACHALAM., M.Tech., Ph.D

It is a pleasure to present this edition of our Automobile Engineering magazine. Our department continues to push the boundaries of innovation, merging engineering principles with Automotive to develop impactful Automotive Sector. Our students and faculty are driving meaningful change. This magazine highlights their inspiring work, research, and achievements. We take pride in nurturing a culture of curiosity, collaboration, and excellence. As we move forward, we remain committed to shaping the future of Automotives through technology, creativity, and dedication

With best wishes
Dr. R.Venkatachalam
HoD-AE
KSRCE

Table of Content

Fluid Flow and Heat Transfer in a single tube-Fin arrangement to fan Automotive Radiator

Radiators are heat exchangers used to transfer thermal energy from one medium to another for the purpose of cooling and heating. The majority of radiators are constructed to function in automobiles, buildings, and electronics. The radiator is always a source of heat to its environment, although this may be for either the purpose of heating this environment, or for cooling the fluid or coolant supplied to it, as for engine cooling. The radiator designs at present depend on the empirical methods, wherein existing experimental data is used as the thumb rules for the design process. However, for any preliminary design the performance of the radiator can be accessed through Computational Fluid Dynamics (CFD) in prior to the fabrication and testing.

In the current study a tube fin arrangement of an existing radiator is analyzed for evaluating the fluid flow and heat transfer characteristics. The geometry of the finned-tube heat exchanger is an intricate one and there are no analytical optimization schemes available to optimize their design, while experimental trial and error is far too time consuming.

V.S.KAMALESH

IV AE

Modified Emission Control system by Wet Scrubber Technique for IC engine

Wet Scrubbers are air pollution control devices for removing particles and gases from automobile vehicle exhaust gases. It is operated by introducing the dirty exhaust gas with a scrubbing liquid as water. Then gases are collected in the scrubbing liquid. Wet scrubbers are usually the most appropriate air pollution control device for collecting both, particulate and gas in a single system alone. Its help of control the air pollution.

Wet scrubbers are devices that remove pollutants from exhaust gas. The goal in absorption and wet scrubbing equipment is the removal of gases and particulate matter from an exhaust gas by causing the gaseous contamination to become dissolved into the liquid gas and the solids to be entrained in the liquid. Low-risk processing of incendiary gases Ability to handle high- temperature, high-humidity gas without temperature limit or condensation problems.

Wet scrubbers are a special device used to remove a variety of pollutants from exhaust gas from furnaces or other devices. These devices use a scrubbing liquid to remove the pollutants. The exhaust gas is moved through the scrubbing liquid (usually through a chamber) and the liquid is misted through the gas. The liquid most commonly used is water. A wet scrubber's particulate collection efficiency is directly related to the amount of energy expended in contacting the gas stream with the scrubber liquid.

SANJEEVI S
III AE

Development and Fabrication of Air Brake System and Power Generation Using Engine Exhaust Gas

A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction. Most brakes commonly use friction between two surfaces pressed together to convert the kinetic energy of the moving object into heat, though other methods of energy conversion may be employed. For example, regenerative braking converts much of the energy to electrical energy. The turbine is connected to a dynamo by means of coupling, which is used to generate power. Depending upon the airflow the turbine will start rotating, and then the dynamo will also start to rotate. A dynamo is a device which is used to convert the kinetic energy into electrical energy. The generated power can be stored in the battery and then this electric power has loaded to the DC compressor. The air compressor compresses the atmospheric air and it stored in the air tank and the air tank has pressure relief valve to control the pressure in the tank. The air tank supplies the compressed pneumatic power to the pneumatic actuator through solenoid valve to apply brake. The pneumatic actuator is a double acting cylinder which coverts pneumatic pressure into linear motion The focus of this project is to review the latest development and technologies on waste heat recovery of exhaust gas from internal combustion engines. This is one of the efficient braking systems using the vehicle's exhaust gas. The exhaust gases are filtered and the pure form of gas is stored in an air tank which in turn can be used for actuating the pneumatic cylinder which results in applying the brakes. With the development of highways, logistics and the pace of life, weight and velocity of vehicles has become more and larger, which has reduced the safety of driving. The braking load of vehicles increases quickly so that the primary brake system is easily overloaded and can be damaged by overheating. The other main advantage of this project is that separate air tank for the pneumatic brakes are not needed. The air exhausted from the engine is stored in a tank and later is used up for applying the brakes

SREEKARAN M V
III AE

Automatic Emergency Braking system using eye blink sensor

But the life lost once cannot be re- winded. Advanced technology over's some hope to avoid these up to some extent. It involves measure and controls the eye blinking using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reacted infrared rays of eye.

An Accident Prevention System which helps in preventing/avoiding accidents. Accident due to cause of drowsy is prevented and controlled when the vehicle is out of control. The accidents due to the drowsy state of the driver is prevented using automatic breaking system by using eye blink sensor. The term used here for the realization that the driver is drowsy is by using eye blink sensor of the driver.

In recent times drowsiness is one of the major problem of highway accidents. These types of accidents occurred caused by drowsy and driver can't able to control the vehicle, when the driver wakes. The drowsiness is indented by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame or IRS. If the driver is drowsy, then the system will give buzzer and the speed of the vehicle is reduced in 3 to 5 sec

GOWDHAM SUNDAR A
III AE

Carbon Fiber 300–Kevlar Hybrid Composite Bumper for Enhanced Impact Resistance in Automobiles

The safety of the vehicle is an important design consideration. The safety of the vehicle can be improved significantly by properly designing the bumper, which will protect against sudden collision. The majority of studies on polymer composite bumpers have focused on single-fiber reinforcement; hybrid composites are known to provide better performance than single reinforcement. This research utilises carbon fibre, along with Kevlar fibre, for the fabrication of a bumper. The model was simulated for crashworthiness by finite element analysis. Experimental results reveal that the CF 300-Kevlar composite bumper outperforms conventional single-fibre composite bumpers in terms of structural integrity, impact energy absorption, and deformation. Finite element analysis (FEA) simulations corroborated the experimental findings, demonstrating that hybrid reinforcement effectively optimizes crash performance. The CF 300-Kevlar hybrid composite bumper has several advantages over traditional metal and single-fibre composite bumpers, including being eco-friendlier, lightweight, and durable.

HARISH C
II AE