



## NEWSLETTER

## MExpress



Department of Mechanical Engineering, KUMARAGURU COLLEGE OF TECHNOLOGY

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Editors: Dr. C. Velmurugan, Mr. B. N. Sreeharan

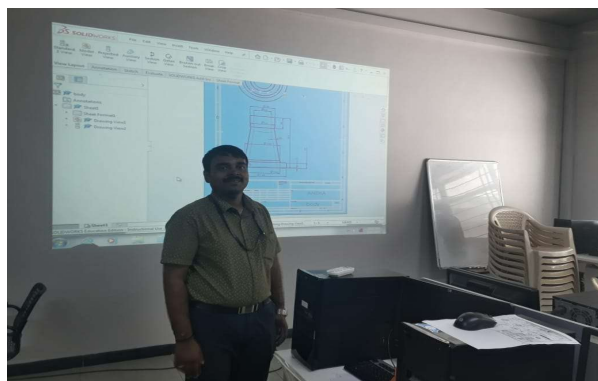
Associate Editors: Mr. P. Kapil, Mr. K. Arun,

### Programmes Organized

- Department organized a Hands on Training in Modeling to B. E. Aeronautical Engineering students using SolidWorks 2018 during 24.06.2019 to 26.06.2019.



Mr. M. Thirumalaimuthukumar, AP (II)/ME, coordinated the training.



### Industry Institute Interaction

Dr. S. Balasubramanian, ASP/ME and Dr. B. Senthilkumar, ASP/ME attended Sinumeric Training center inauguration at Lavender Technologies & Solution, Coimbatore on 03.05.2019.

### Faculty Development Programme

- Dr. N. Sangeetha, Sr. ASP/ME participated in AICTE sponsored Short Term Training Program in the title of "Methods and Best Practice of vibration Analysis in an Automotive Industries" organised by department of mechanical engineering, Government College of Engineering, Bargur from 13.06.2019 to 19.06.2019
- Mr. Jeeva B, AP/ME participated in Summer Faculty Research Fellowship Programme (SFRF-2019) at IIT Delhi from 13.05.2019 to 25.06.2019.
- Dr. K. M. Senthilkumar, ASP/ME participated in AICTE Sponsored one-week QIP short term course on "Laboratory and Ergonomic Safety for Engineers" conducted by IIT, Bombay from 10.06.2019 to 14.06.2019.

### External Examinership

- Dr. N. Sangeetha, Sr. ASP/ME, acted as external examiner for the Central Valuation at Government College of Technology, Coimbatore on 28.06.2019.
- Dr. A. P. Arun, AP (ii)/ME and Mr. K. Krishnamoorthi, AP (II)/ME acted as external examiners for the Central Valuation at

Government College of Technology, Coimbatore  
on 25.06.2019 and 26.06.2019.

## Electric Vehicle

### 1. Why Electric Vehicles (EV)?

There are many reasons why people are moving to Electric Vehicles (EV) to get them to the places they need to be. These include:

- EVs are fun to drive because they are fast and smooth.
- Many studies show that the emissions from burning fossil fuels such as gasoline produce harmful greenhouse gases. EV's produce no smelly fumes or harmful greenhouse gases.
- EVs are innovative and cool.
- EVs operational cost is less than compared to a gasoline vehicle.
- EVs are a smart and convenient choice.

### 2. How far can I drive before I have to recharge?

The first question many ask is how far an Electric Vehicle travel before it needs to be recharged.

Firstly, when was the last time you ran out of gas in your vehicle?? For most people the answer is never, because they watch the fuel gauge and fill up their tank when it is almost empty. It's the same with an EV, you can pull into one of the public charging stations (will set up) to "top up" or plug your car in each night at home just like you do with your cell phone and always leave home with a full battery.

The average daily drive in urban regions is 30km and all electric vehicles today can drive at least 100km's before needing to be recharged. If you need more there are some BEVs that can drive up to 426km or you could look at a hybrid vehicle which also has a gasoline engine that can be used once the battery runs out.

### 3. What is the difference between an Electric Vehicle and a Hybrid?

There are 3 types of electric vehicle:

- Battery Electric Vehicle (BEV),
- Plugin Hybrid Electric Vehicle (PHEV)
- Hybrid Electric Vehicle (HEV)

### Battery Electric Vehicle (BEV)

A battery electric vehicle (BEV) runs entirely using an electric motor and battery, without the support of a traditional internal combustion engine, and must be plugged into an external source of electricity to recharge its battery. Like all electric vehicles, BEVs can also recharge their batteries through a process known as regenerative braking, which uses the vehicle's electric motor to assist in slowing the vehicle, and to recover some of the energy normally converted to heat by the brakes.

#### Pros

- No emissions
- No gas or oil changes
- Ability to conveniently charge at home
- Fast and smooth acceleration
- Low cost of operation.

#### Cons

- Shorter range than gasoline vehicles, although most people drive well within the range of today's BEV and could rent a hybrid for the rare long trips.
- Slightly more expensive than their gasoline equivalent although the gasoline savings pay off the difference in typically 2-3 years.

### Plug-in Hybrid Electric Vehicle (PHEV)

Plug-in hybrids (PHEVs) use an electric motor and battery that can be plugged into the power grid to charge the battery, but also has the support of an internal combustion engine that may be used to recharge the vehicle's battery and/or to replace the electric motor when the battery is low.

Because Plug-in Hybrids use electricity from the power grid, they often realize more savings in fuel costs than tradition hybrids electric vehicles (HEV).

#### Pros

- Longer range than BEV
- Less gas consumption than gas only vehicle
- Fewer emissions
- Very simple mechanics, less to go wrong.

## Cons

- Produces tailpipe emissions
- Needs gas and oil changes
- More expensive to operate than Battery Electric Vehicle (BEV) but less than traditional hybrid vehicle (HEV).

## Hybrid Electric Vehicle (HEV)

Hybrid Electric Vehicles (HEVs) have two complementary drive systems: a gasoline engine with a fuel tank; and an electric motor with a battery. Both the engine and the electric motor can turn the transmission at the same time, and the transmission then turns the wheels. HEVs cannot be recharged from the electricity grid – all their energy comes from gasoline and from regenerative braking.

## Pros

- Longer range than BEV
- Less gas consumption than gas only vehicle
- Fewer emissions than gas only vehicle

## Cons

- Still produces emissions
- Complex mechanics – Gasoline + Electric
- Expensive to operate (8-10 times more expensive than BEV) but less than traditional gasoline vehicle.
- No ability to conveniently charge at home.

## 4. How do you charge your EV?

Now that you have chosen the EV that best fits your needs, how do you charge it up? Well it's as easy as charging your phone and can be done in the comfort of your home or at the public charging stations which will be set up in near future.

- It's easy to charge every night they so EV drivers don't need as much one-time range as a typical gas-engine car driver who may refuel once a week or once a month.
- When you charge at home you can always leave with a full battery.
- Through charging stations, there is a good chance you can charge your EV while you are at work, shopping, at the movies, at the mall, at

the doctor or dentist, etc so you can probably drive further than you think.

EV's will also charge themselves whenever you brake or go downhill so sometimes you will have more range available at the bottom of the hill than you did at the top.

There are a couple of different types of charges each with different times it takes to charge your EV, as detailed below.

### Level 1 – Trickle Charge

- You can plug your EV into any normal plug just like you do to charge your phone.
- The charging cable will come with your EV.

### Level 2 –Charge @ Home

- You can purchase a charging station for your home.
- A certified electrician will need to install this.
- These chargers typically take 3-4 hours for a full charge.

### Level 2 – Public Charging Station

- There will be public charging stations set up and many are free of charge.
- These chargers typically take approx. 4 hours for a full charge.

### Level 3- FAST Charge (High Power Stations)

- Charges your EV in 30min!
- There are a number of Fast Chargers will be coming up
- You EV needs to be equipped to support a Fast Charger

## 5. Public Charging Stations

With public charging stations there is bound to be somewhere you can top up while you are shopping, going to the movies, at work, grabbing a bite to eat.

- Compilation by Mr. B. N. Sreeharan, AP (II)/ME



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**KUMARAGURU**  
college of technology

COIMBATORE – 641 049

**Department of Mechanical Engineering**

**INSTITUTE VISION**

The vision of the college is to become a technical university of International Standards through continuous improvement.

**INSTITUTE MISSION**

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

**DEPARTMENT VISION**

To emerge as a center, that imparts quality higher education through the programme in the field of Mechanical Engineering and to meet the changing needs of the society.

**DEPARTMENT MISSION**

The department involves in sustained curricular and co-curricular activities with competent faculty through teaching and research that generates technically capable Mechanical Engineering professionals to serve the society with delight and gratification.

**PROGRAMME OUTCOMES (POS)**

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

#### PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

- PEO 1 :** Graduates will take up career in manufacturing and design related disciplines.
- PEO 2 :** Graduates will be involved in the execution of Mechanical Engineering projects.
- PEO 3 :** Graduates will take up educational programme in mastering Mechanical sciences and management studies.

#### PROGRAMME SPECIFIC OUTCOMES (PSOS)

1. Apply the fundamentals of science and mathematics to solve complex problems in the field of design and thermal sciences.
2. Apply the concepts of production planning and industrial engineering techniques in the field of manufacturing engineering.