

**Department of Mechanical Engineering  
Academic year 2023-24 (ODD)**

**Circular**

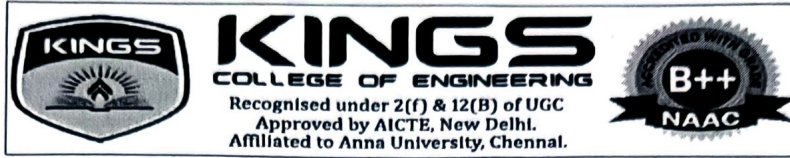
**Date : 22.08.2023**

This is to inform you that there will be an internal seminar going to be conducted by our Department on 26.08.2023 at 12.30P.M on the topic "Hydrogen Fuel Cell Vehicles" by Mr. H.Agilan, Assistant Professor/Mechanical at Department Smart Classroom. Staff members are instructed to utilize the session and communicate your queries.

*T. P. Arumugam*  
**HoD/Mech** 22/8/23

**H.O.D**

DEPARTMENT OF MECHANICAL ENGINEERING  
KINGS COLLEGE OF ENGINEERING  
PUNALKULAM



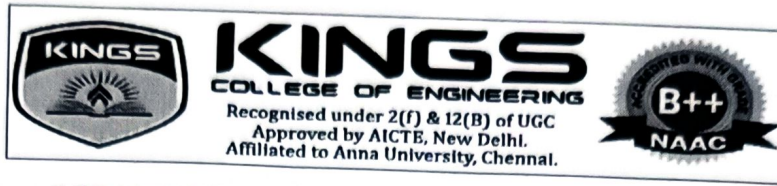
**Department of Mechanical Engineering**  
**Academic year 2023-24 (ODD)**  
**INTERNAL STAFF SEMINAR ATTENDANCE SHEET**

Date & time : 26.08.2023 & 12.30 P.M  
 Venue : Department Smart Classroom  
 Topic : Seminar on "Hydrogen Fuel Cell Vehicles"  
 Resource person : Mr.H. Agilan /Mechanical

S. No	Staff Name	Signature
1	Dr.T.Pushparaj	<i>T. Pushparaj</i>
2	Dr.P.P.Shantharaman	<i>P.P. Shantharaman</i>
3	Dr. R.Shankar	<i>R. Shankar</i>
4	Mr. N.Magesh	<i>N. Magesh</i>
5	Dr. M.Melwin Jagatheesh Sridhar	<i>M. Melwin Jagatheesh Sridhar</i>
6	Mr. S. Sabanayagam	<i>S. Sabanayagam</i>
7	Mr. M.Sakthivel	<i>M. Sakthivel</i>
8	Mr. S.Nelson Raja	<i>S. Nelson Raja</i>
9	Mr. R.Rajadurai	<i>R. Rajadurai</i>
10	Mr. V.Aravind	<i>V. Aravind</i>
11	Mr. S.Balaganesh	<i>S. Balaganesh</i>
12	Mr. M. Vivekananthan	<i>M. Vivekananthan</i>
13	Mr. K. Rajesh Kumar	<i>K. Rajesh Kumar</i>

*H.A.*  
 Staff Incharge  
 26/8/23

*T. Pushparaj*  
 HOD/MECH  
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 26/8/23  
 DEPARTMENT OF MECHANICAL ENGINEERING  
 KINGS COLLEGE OF ENGINEERING  
 PUNALKULAM



**DEPARTMENT OF MECHANICAL ENGINEERING  
ACADEMIC YEAR 2023-24 (ODD)  
INTERNAL STAFF SEMINAR REPORT**

Date& time : 26.08.2023 & 12.30 P.M.  
Venue : Department Smart Classroom  
Topic : Seminar on "Hydrogen Fuel Cell Vehicles"  
Resource person : Mr. H.Agilan  
Assistant Professor,  
Mechanical Engineering,  
Kings College of Engineering-Punalkulam.

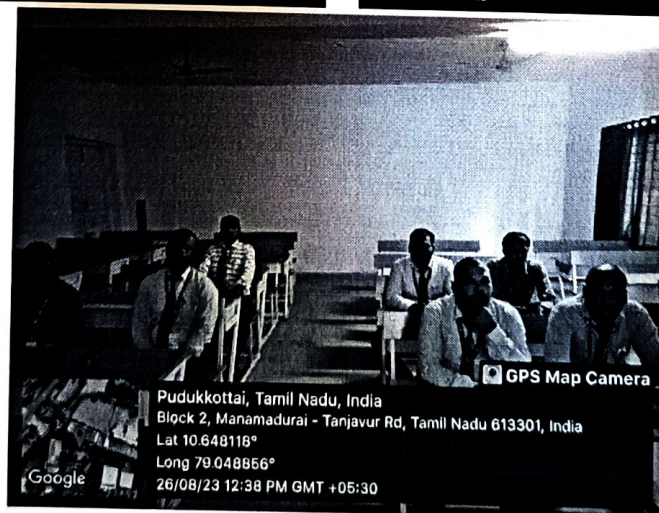
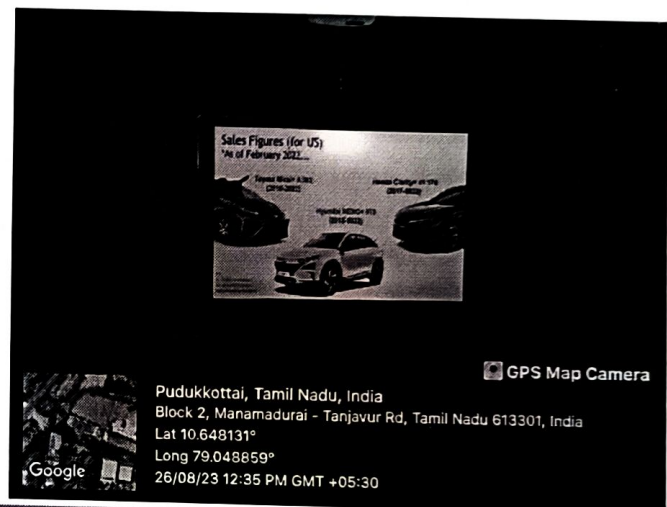
On behalf of the Department of Mechanical Engineering organized an Internal Seminar on "Hydrogen Fuel Cell Vehicles" for faculty members of the Mechanical Department on 26.08.2023 at smart class room. The main objective of the internal seminar is to provide exposure to our faculty members on various research areas in Electrical and Hydrogen vehicles.

**The Following Points were Discussed During the Session:**

- Fuel cell electric vehicles (FCEVs) are powered by hydrogen. They are more efficient than conventional internal combustion engine vehicles and produce no harmful tailpipe emissions.
- They only emit water vapor and warm air. FCEVs and the hydrogen infrastructure to fuel them are in the early stages of implementation.
- FCEVs use a propulsion system similar to that of electric vehicles, where energy stored as hydrogen is converted to electricity by the fuel cell.
- Unlike conventional internal combustion engine vehicles, these vehicles produce no harmful tailpipe emissions.
- FCEVs are fueled with pure hydrogen gas stored in a tank on the vehicle. Similar to conventional internal combustion engine vehicles, they can fuel in about 5 minutes and have a driving range of more than 300 miles.
- FCEVs are equipped with other advanced technologies to increase efficiency, such as regenerative braking systems that capture the energy lost during braking and store it in a battery.



- Major automobile manufacturers are offering a limited but growing number of production FCEVs to the public in certain markets, in sync with what the developing infrastructure can support.
- The most common type of fuel cell for vehicle applications is the polymer electrolyte membrane (PEM) fuel cell. In a PEM fuel cell, an electrolyte membrane is sandwiched between a positive electrode (cathode) and a negative electrode (anode). Hydrogen is introduced to the anode, and oxygen (from air) is introduced to the cathode.
- The hydrogen molecules break apart into protons and electrons due to an electrochemical reaction in the fuel cell catalyst. Protons then travel through the membrane to the cathode.



**Snapshots of the session**

**Chapters Discussed:**

- Hydrogen Basics
- Benefits & Considerations
- Stations
- Vehicles

### Outcomes:

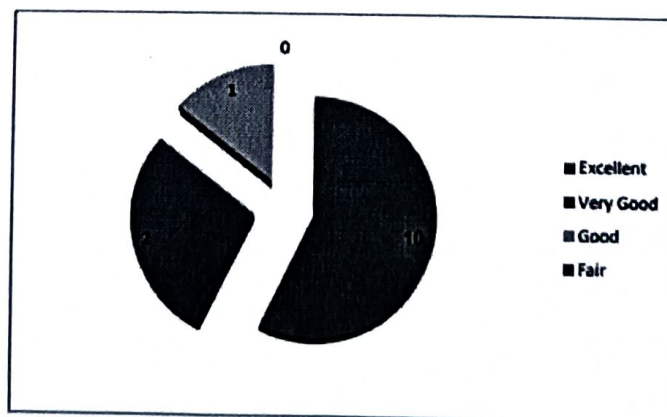
Upon listing of this seminar the participants can able to

- Understand the various types of fuels and their properties.
- Understand the concepts hydrogen vehicles and processing technology.
- Able to understand the concept of energy security and public health and environment.

### References:

1. Yuanying Chi, et all. "Fuel-cycle based environmental and economic assessment of hydrogen fuel cell vehicles in China" - Energy, June 2023, Volume 282, 128773.
2. Wenyue Zhang, et all. "The alternative path for fossil oil: Electric vehicles or hydrogen fuel cell vehicles" - Journal of Environmental Management. Volume 341, May 2023, 118019.
3. Ting Shi, et all. "Experimental investigation on the start-stop performance of gas foil bearings-rotor system in the centrifugal air compressor for hydrogen fuel cell vehicles" - International Journal of Hydrogen Energy, June 2023.
4. Sidhartha Harichandan, Sanjay Kumar Kar. "An empirical study on motivation to adopt hydrogen fuel cell vehicles in India: Policy implications for stakeholders" - Journal of Cleaner Production, Volume 408, July 2023, 137198.
5. Pobitra Halder, et all. "Advancements in hydrogen production, storage, distribution and refuelling for a sustainable transport sector: Hydrogen fuel cell vehicles" - International Journal of Hydrogen Energy, June 2023.

### Feedback Analysis:



*[Signature]*  
Staff Incharge 31/8/23

*T. Parthasarathy*  
HOD/MECH 31/8/23

*J. Praveen*  
Principal 05/9/23