



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

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## Department of Mechanical Engineering

### *REPORT OF SKILL BASED MINI PROJECT*

### **120513: Heat & Mass Transfer**

#### **Title of Project: Conduction, Convection and Radiation**

#### **Introduction:**

In this Project we study about heat transfer and their types which is most important, when we talk about heat and mass transfer.

#### **Description of project:**

In this project we study that Conduction is the transfer of heat in solids through direct contact whereas convection is the transfer of heat within fluids and radiation is the transfer of heat through electromagnetic waves.

#### **Applications of project:**

- 1. Heating of utensils while cooking.
- 2. Heating of metallic plate in electric iron.
- 3. Heating of metallic coil in iron - rod, which is used to heat the water.

#### **What is heat transfer:**

The movement of heat across the border of the system due to a difference in temperature between the system and its surroundings.

#### **Types of Heat Transfer:**

##### **Conduction;**

The process of transmission of energy from one particle of the medium to another with the particles being in direct contact with each other.

Following are the examples of conduction:

- Ironing of clothes is an example of conduction where the heat is conducted from the iron to the clothes.
- Heat is transferred from hands to ice cube resulting in the melting of an ice cube when held in hands.

##### **Convection:**

The movement of fluid molecules from higher temperature regions to lower temperature regions.

Examples of convection include:

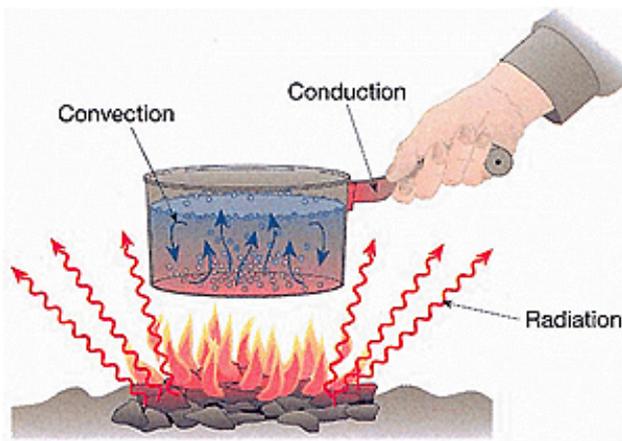
- Boiling of water, that is molecules that are denser move at the bottom while the molecules which are less dense move upwards resulting in the circular motion of the molecules so that water gets heated.
- Warm water around the equator moves towards the poles while cooler water at the poles moves towards the equator.

### Radiation:

Thermal radiations are referred to as radiant heat. Thermal radiation is generated by the emission of electromagnetic wave.

Following are the examples of radiation:

- Microwave radiation emitted in the oven is an example of radiation.
- UV rays coming from the sun is an example of radiation.
- The release of alpha particles during the decaying of Uranium-238 into Thorium-234 is an example of radiation.



### What I Learned Through Project:

We learned about flow of heat through conduction, convection and radiation

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