# SNS COLLEGE OF TECHNOLOGY

**Coimbatore-35**
**An Autonomous Institution**

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## DEPARTMENT OF AUTOMOBILE ENGINEERING

### 19AUE302 – AUTOMOTIVE SAFETY & INFOTRONICS

III YEAR / V SEM

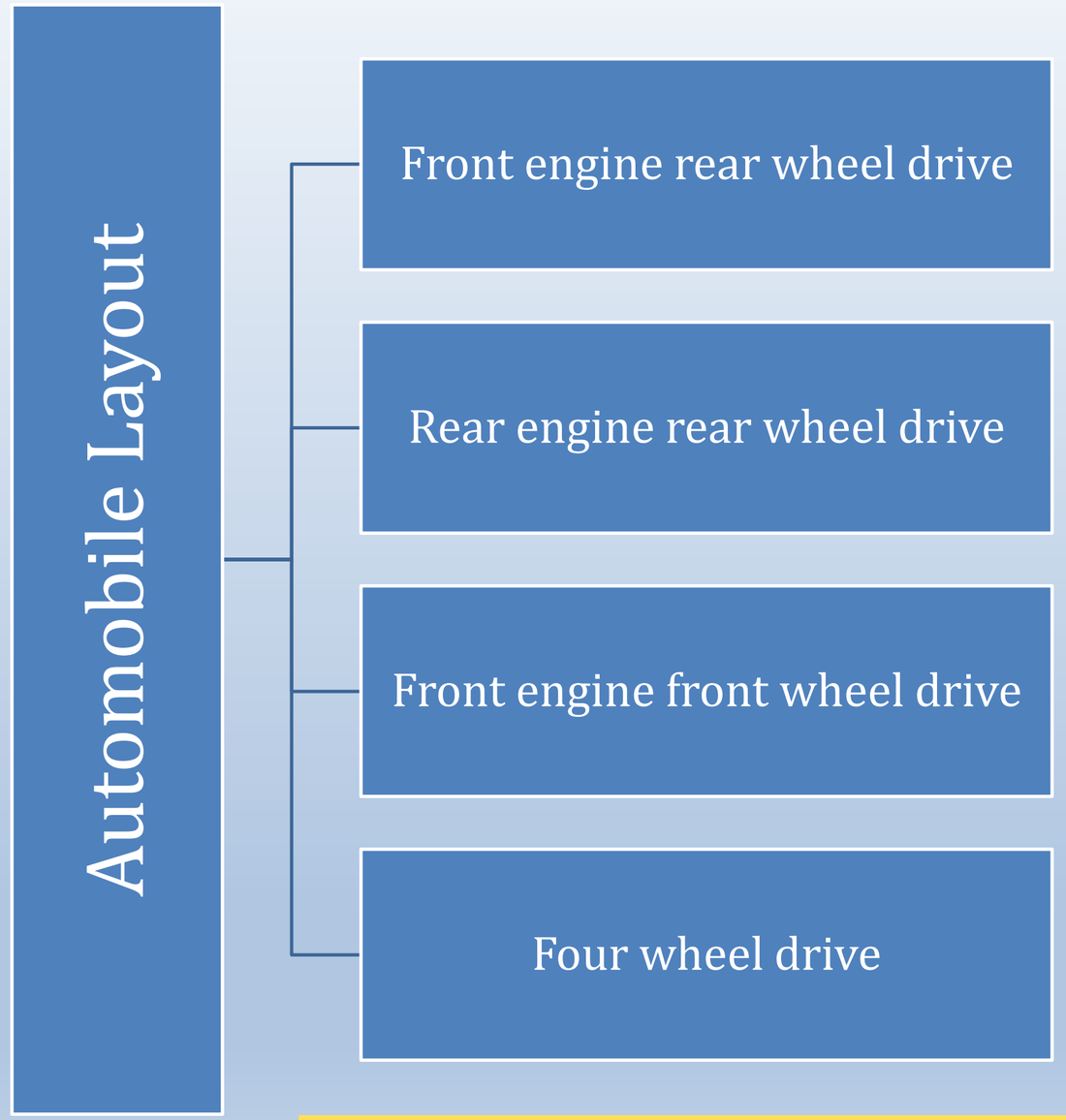
UNIT – 1 INTRODUCTION

*Topic – 3 Engine Location*

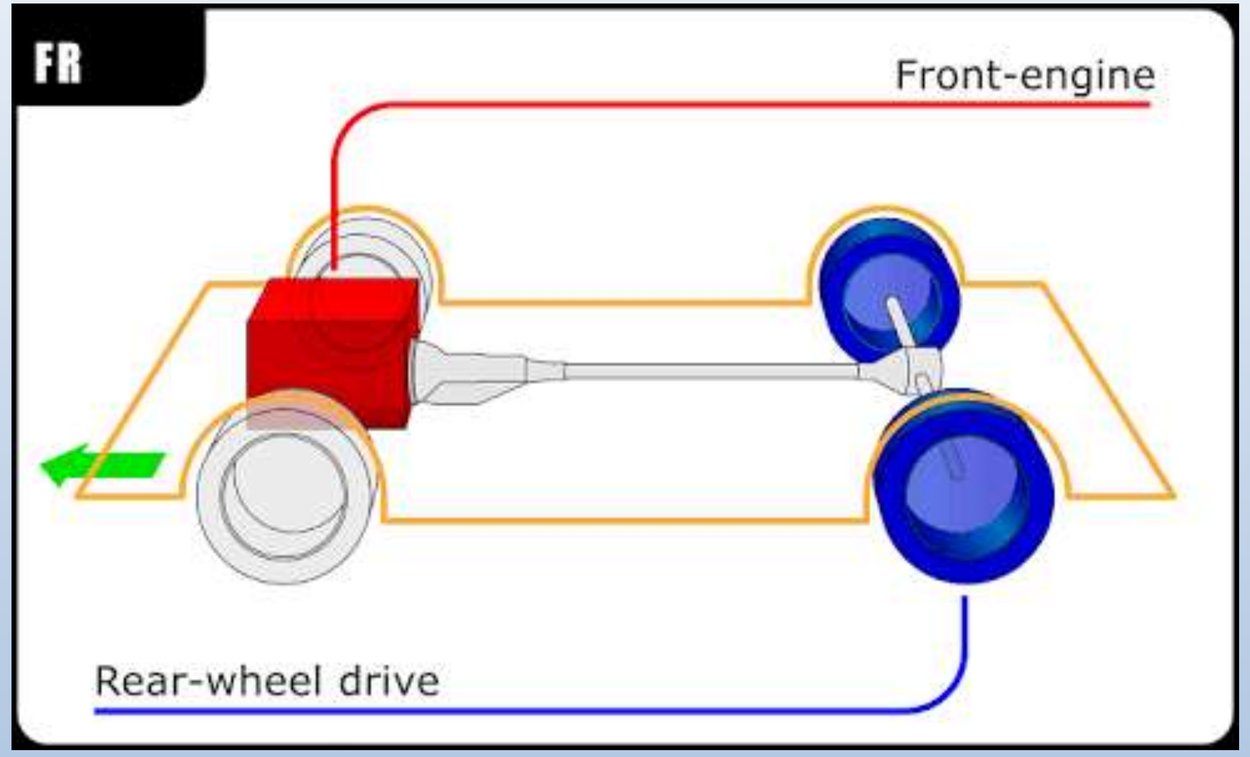
# PRESENTATION OUTLINE

- Types of Automobile Layout
- Front Engine Rear Wheel Drive
- Rear Engine Rear Wheel Drive
- Front Engine Front Wheel Drive
- Mid Engine Rear Wheel Drive
- Four Wheel Drive

# TYPES OF AUTOMOBILE LAYOUT

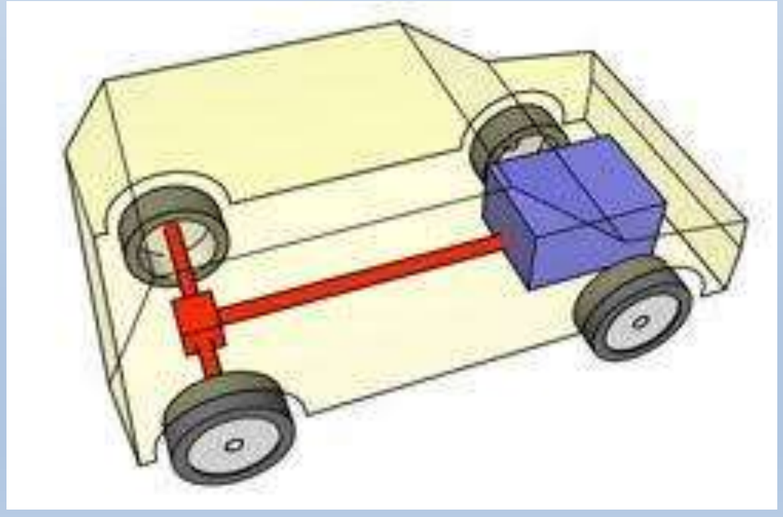


# FRONT ENGINE REAR WHEEL DRIVE




- Rear wheel drive places the engine in the front of the vehicle and the driven wheels are located at the rear

- In this layout a front mounted engine-clutch-gear box unit drives a beam type rear axle supported on leaf springs through a propeller shaft with two universal joints



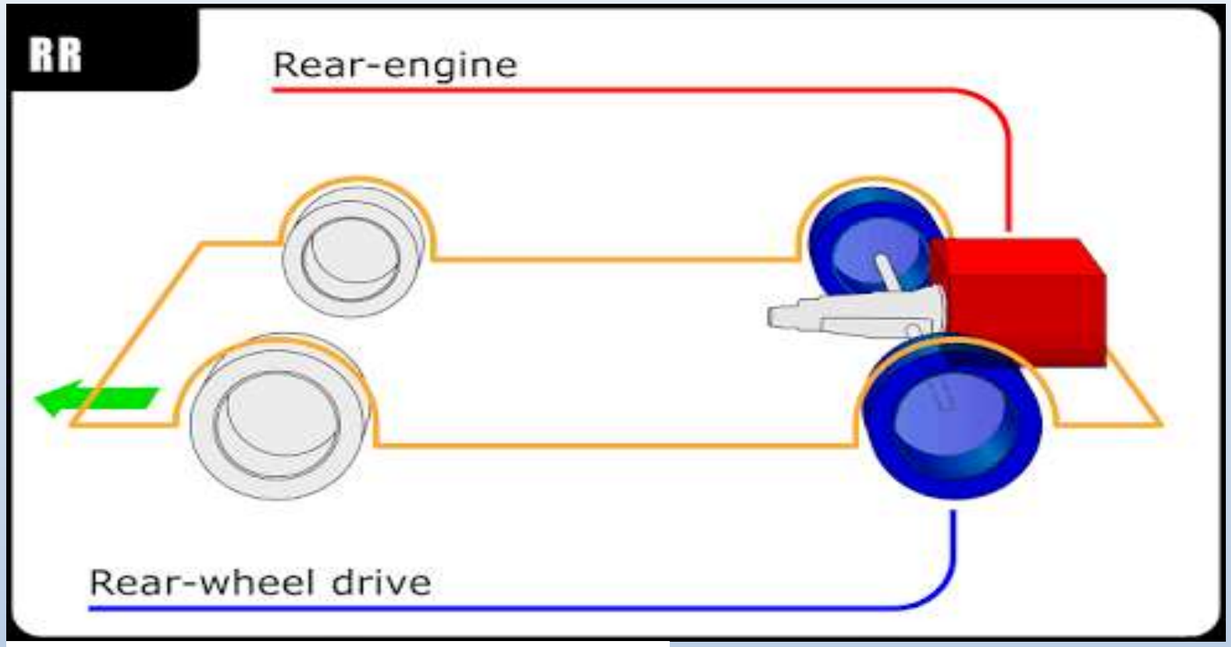
# ADVANTAGES

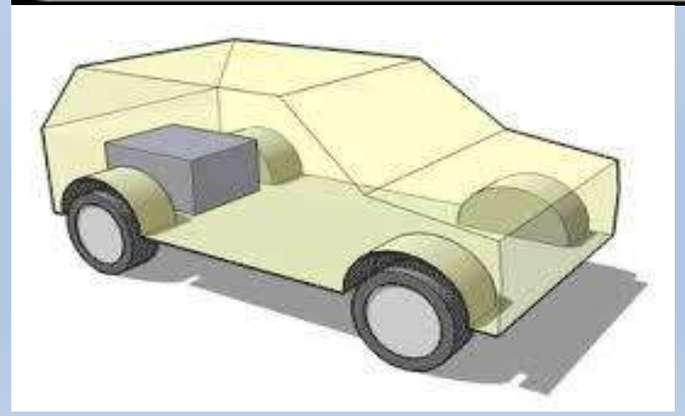
- Even weight distribution
- Large luggage space
- Maintenance and accessibility of engine, gear box is easy and the control over the accelerator, clutch, choke simple
- Radiator cooling is natural
- Better braking efficiency

# DISADVANTAGES

- Reduces back seats leg room space
- A tunnel is needed for the propeller shaft
- Reduces boot space
- Heavier and more expensive
- If stuck in mud or snow it is harder to drive away than in a front wheel drive car

# Rear Engine Rear Wheel Drive



- This layout consists of placing the engine, clutch and gearbox in the back. So taking the space of the boot.
- In these type of layout more than 50% of the weight is on the rear axle.
- The necessity of the propeller shaft is completely eliminated.
- The clutch, gear box and engine and final drive form a single unit.

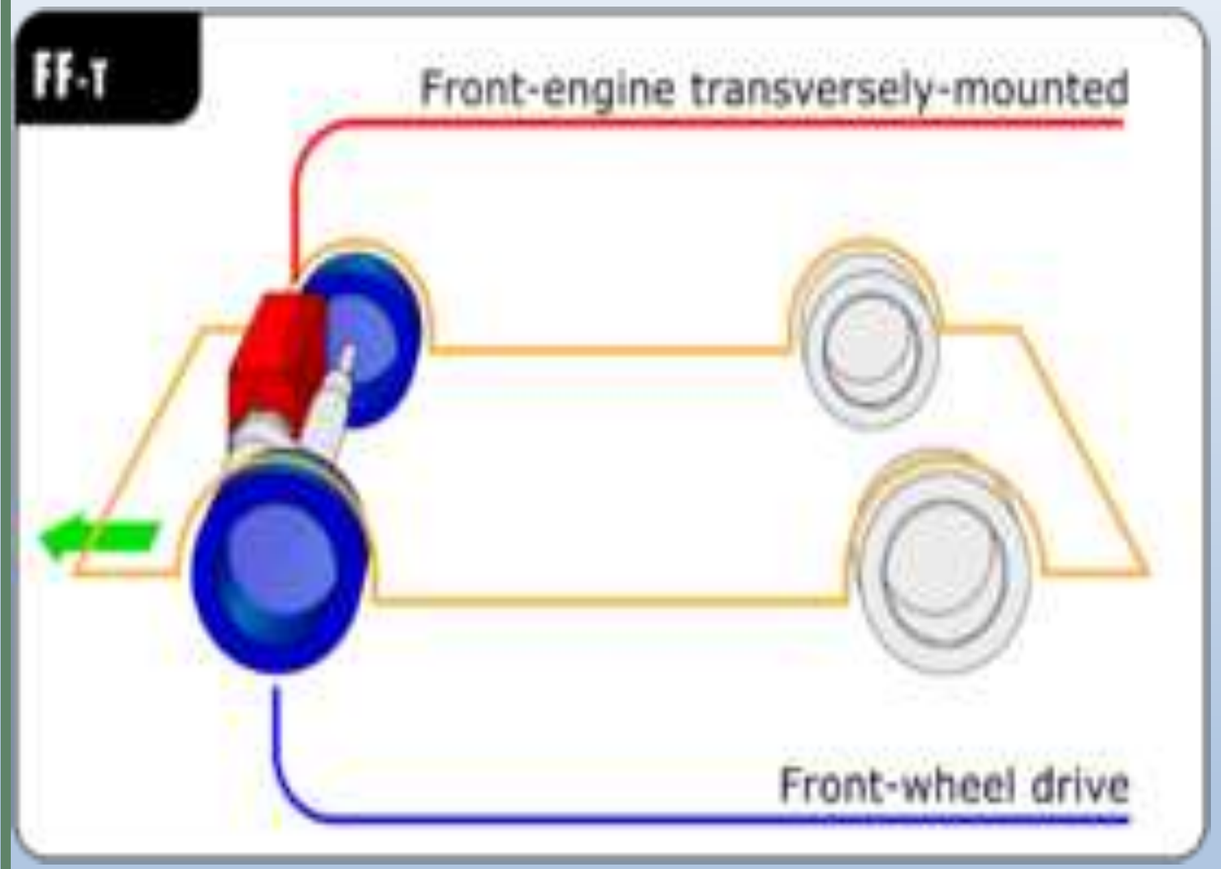
# ADVANTAGES

- Excellent traction is available while climbing hills
- A larger passenger space is available for the given length of body
- Very compact and accessible power and transmission assembly is provided
- Lot of weight at the back improves acceleration and braking
- Passengers are comfortable from engine noise, heat and fumes.
- Front of the vehicle provides good visibility and by designing the body to aerodynamic shape gives good streaming lining

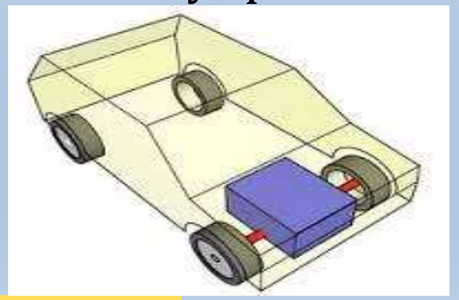
# DISADVANTAGES

- At high speed, relatively high proportions of weight at the rear axle will make the car unstable at speed
- There is a strong tendency for the vehicle to oversteer
- The space at the front has to be reduced to allow for the steering lock of the front wheel
- Space utilized for engine compartment is wasted

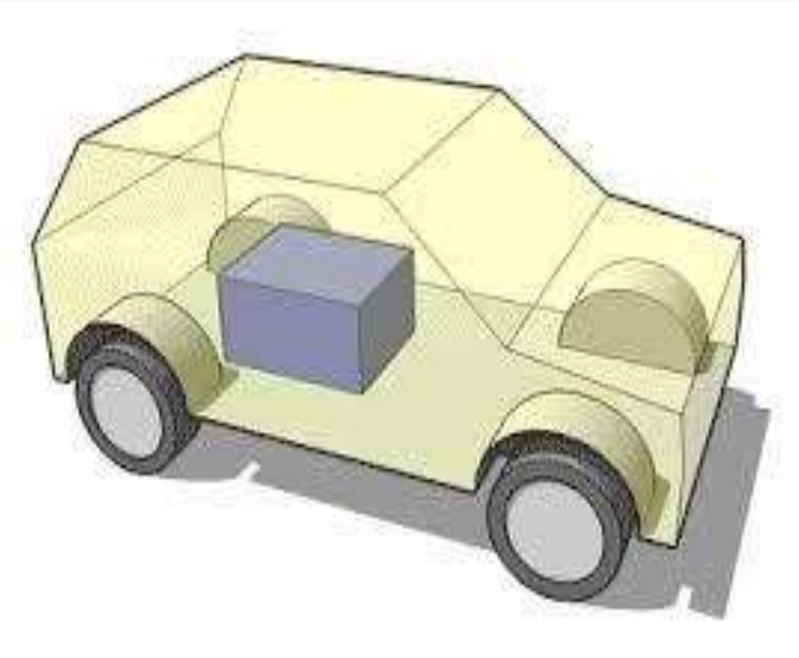
# FRONT ENGINE FRONT WHEEL DRIVE




- Optimum Passenger Space
- The propeller shaft length is reduced or neglects the propeller shaft
- Good grip with road surface due to engine weight at front
- Power required for the cooling is reduced. When the vehicle is to be ‘steer in’ to the curve, it provide ‘under-steer’ characteristics, which is always preferred



# MID-ENGINE, REAR WHEEL DRIVE



- This type of engine layout places the engine between the two axles and the rear wheels are driven.
- weight is equally distributed between front and rear wheel

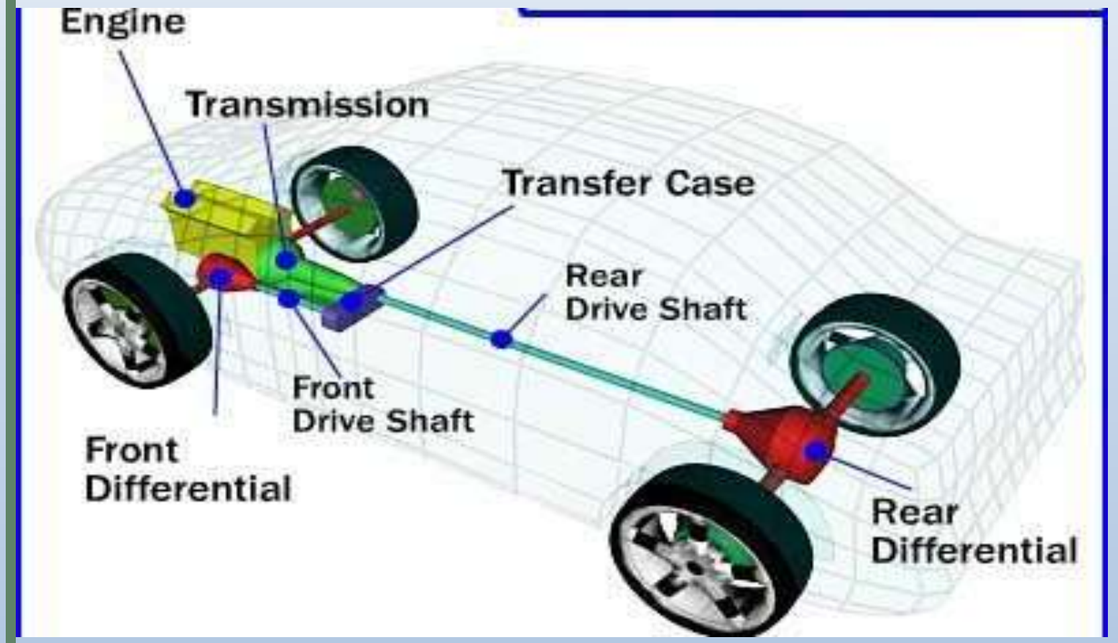
**Advantages:**

- Good acceleration because of back weight transfer
- Efficient braking
- Neutral handling

# DISADVANTAGES

- Difficulties with the cooling system
- When accelerating some steering is lost
- Require more space
- No back seats

# FOUR WHEEL DRIVE




- In this arrangement all the four wheels of the vehicle are driven by the engine thus making the entire vehicle weight available for traction.
- These four wheel drive vehicles are very useful on Hill station if one of the wheel slipping or skidding then the other axle wheel transmit the tractive force to the vehicle.
- The steering of the four wheel drive is hard to operate compared with other type of drive.