INTRODUCTION TO AUTOMOBILE ENGINEERING

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Hello Class: Good morning!
The term automobile is derived from the Greek word “autos”, which means self,

and the French word “mobile”, which means moving.
Facts

- Automobiles have around more than 100 years
  - Originally called horseless carriages

- Today more than 130 million cars in the U.S.
  - One-third of cars in the world

  - The official land-speed record (measured over one mile) is 1,227.985 km/h!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

- Total registered vehicles in Bangladesh 1030864
007

Top speed 299 km/h

Aston Martin DB9 V12
A SHORT HISTORY LESSON!

- In 1807, François Isaac de Rivaz designed the first car powered by an internal combustion engine fueled by hydrogen.
- In 1886, Karl Benz developed a petrol or gasoline powered automobile. This is also considered to be the first "production" vehicle as Benz made several other identical copies. The automobile was powered by a single cylinder two stroke engine.
- Henry Ford made mass production.
AUTOMOBILE

- Automobile is a vehicle driven by an internal combustion engine.

- **Automobile Engineering** is a branch of engineering which deals with designing, manufacturing and operating automobiles.
Some Important Terms
WHAT ARE PART, ASSEMBLY & COMPONENT

- A part is the smallest removable item on a car. A part is not normally disassembled.

- The word component is frequently used when referring to an electrical or electronic part. For example, a spark plug is an ignition system component that ignites the fuel in the engine.
An assembly is a set of fitted parts designed to complete a function.

For example, the engine is an assembly that converts fuel into useable power to move the vehicle.
FRAME AND BODY

- The frame is the strong metal structure that provides a mounting place for the other parts of the vehicle.

- The frame holds the engine, transmission, suspension, and other assemblies in position.

- The body is a steel, aluminum, fiberglass, plastic, or composite skin forming the outside of the vehicle. The body is painted to give the vehicle an attractive appearance.
The term chassis is often used when referring to a vehicle’s frame and everything mounted to it except the body—tires, wheels, engine, transmission, drive axle assembly, and frame.
CHASSIS

- Shock Absorber
- Frame
- Steering Linkage
- Cross Member
- Side Member
CHASIS
BODY FRAME

- To support the vehicle's mechanical components and body
- To deal with static and dynamic loads, without undue deflection or distortion.
  - Weight of the body, passengers, and cargo loads.
  - Vertical and torsional twisting transmitted by going over uneven surfaces.
  - Transverse lateral forces caused by road conditions, side wind, and steering the vehicle.
  - Torque from the engine and transmission.
  - Longitudinal tensile forces from starting and acceleration, as well as compression from braking.
  - Sudden impacts from collisions.
TYPES OF CONSTRUCTION OF AUTOMOBILE

1. Body-over-frame construction

2. Unibody construction
A **unibody frame** is a type of vehicle construction where the both the body of the car and the **chassis** forms a single unit; reinforcements are then added to other specific sections of the car.

**Body-on-frame** is an automobile construction method by which a separate body is mounted on a relatively rigid frame or chassis that carries the engine and drivetrain.
**Basic features of automotive body:**

- **Body and frame**—support and enclose the vehicle

- **Engine**—provides dependable, efficient power for the vehicle

- **Computer systems**—monitor and control various vehicle systems.

- **Fuel system**—provides a combustible air-fuel mixture to power the engine.
- **Electrical system**—generates and/or distributes the power needed to operate the vehicle’s electrical and electronic components.

- **Cooling and lubrication systems**—prevent engine damage and wear by regulating engine operating temperature and reducing friction between internal engine parts.
Exhaust and emission control systems—quiet engine noise and reduce toxic substances emitted by the vehicle.

Drive train systems—transfer power from the engine to the drive wheels.

Suspension, steering, and brake systems—support and control the vehicle.

Accessories and safety systems—increase occupant comfort, safety, security, and convenience.
Suspension is the system of tires, tire air, springs, shock absorbers and linkages that connects a vehicle to its wheels and allows relative motion between the two.
THANK YOU