SNS COLLEGE OF TECHNOLOGY
(An Autonomous Institution)

Department of Aerospace Engineering

23AST101-Fundamentals of Aerospace Engineering

UNIT-2:
AERODYNAMICS

MISSILES

Mr.N.Venkatesh (AP/Aerospace)

Missiles are self-propelled guided weapons systems designed to deliver an explosive payload to a target. They are used in various military applications and can be classified based on their launch platform, range, and purpose.

Here are some key types of missiles:

1. Based on Launch Platform:

Surface-to-Surface Missiles (SSM): Launched from ground to target ground-based objectives.
Example: *Scud*, *Tomahawk*.

Surface-to-Air Missiles (SAM): Launched from ground to target aircraft or other missiles.
Example: *Patriot*, *S-400*.

Air-to-Air Missiles (AAM): Launched from aircraft to target other aircraft.
Example: *AIM-9 Sidewinder*, *AIM-120 AMRAAM*.

Air-to-Surface Missiles (ASM): Launched from aircraft to target ground or sea-based objectives.
Example: *AGM-65 Maverick*, *Storm Shadow*.

Submarine-Launched Ballistic Missiles (SLBM): Launched from submarines to target land-based objectives.
Example: *Trident II*, *Bulava*.

2. Based on Range:

Short-Range Missiles: Typically less than 1,000 km.
Example: *Hellfire*, *Javelin*.

Medium-Range Missiles: Between 1,000 and 3,000 km.
Example: *Iskander*, *BrahMos*.

Intermediate-Range Missiles: Between 3,000 and 5,500 km.
Example: *Pershing II* (historical).

Intercontinental Ballistic Missiles (ICBMs): Over 5,500 km.
Example: *Minuteman III*, *RS-24 Yars*.

3. Based on Purpose:

Ballistic Missiles: Follow a parabolic trajectory, primarily used for long-range strikes.
Example: *Scud*, *Minuteman III*.

Cruise Missiles: Fly at low altitudes and are guided to their targets, often used for precision strikes.
Example: *Tomahawk*, *BrahMos*.

Anti-Ship Missiles: Designed to target naval vessels.
Example: *Harpoon*, *Exocet*.

Anti-Tank Missiles: Designed to destroy armored vehicles.
Example: *Javelin*, *Kornet*.

Anti-Satellite Missiles (ASAT): Designed to destroy satellites in orbit.
Example: *ASM-135 ASAT*.

4. Guidance Systems:
Inertial Guidance: Uses onboard sensors to track position and velocity.
GPS Guidance: Relies on satellite signals for precision.
Laser Guidance: Uses laser beams to direct the missile.
Infrared Homing: Tracks heat signatures, commonly used in air-to-air missiles.
Radar Guidance: Uses radar signals to locate and track targets.

5. Propulsion Systems:
Solid Propellant: Simple, reliable, and used in many short-range missiles.
Liquid Propellant: Offers higher performance but is more complex.
Ramjet/Scramjet: Used in high-speed cruise missiles like *BrahMos-II*.

6. Modern Developments:

Hypersonic Missiles: Travel at speeds greater than Mach 5, making them difficult to intercept.
Example: *Avangard*, *Zircon*.
Stealth Missiles: Designed to evade radar detection.
Swarm Missiles: Multiple missiles working in coordination to overwhelm defenses.

TOP 10 MOST MISSILES POWERFUL MISSILES


6
LGM-30G MINUTEMAN-III
18.2 m
Range: 13,000 km
Accuracy: 200 m
Speed: 28,400 km/h
7
DONGFENG-5B
20 m
Range: 15,000 km
Accuracy: 800 m
Speed: 26,950 km/h
8
RS-28 SARMAT
36 m
Range: 10,000 km
Accuracy: 10 m
Speed: 25,500 km/h
9
JERICHO III
16 m
Range: 11,500 km
Accuracy: Classified
Speed: 25,000 km/h
10
RS-24 YARS
23 m
Range: 12,000 km
Accuracy: 150-250 m
Speed: 24,500 km/h
Tank Size


THANK YOU!