

# International Space Station (ISS)

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**In news**– Russia has threatened that the sanctions, some of which predate Moscow's invasion of Ukraine, could disrupt the operation of Russian spacecraft servicing the ISS and may even lead to a crash of the ISS .

## About the International Space Station (ISS)-

- It is a **modular space station (habitable artificial satellite) in low Earth orbit.**
- **Launched in 1998**, the International Space Station **is one of the most ambitious international collaborations ever attempted.**
- The **ISS programme evolved from the Space Station Freedom**, an American proposal which was conceived in 1984 to construct a permanently manned Earth-orbiting station, and the contemporaneous Soviet/Russian *Mir-2* proposal from 1976 with similar aims.
- The largest space station ever constructed, the ISS continues to be assembled in orbit.
- It was **built with the cooperation of scientists from five international space agencies – NASA of the U.S., Roscosmos of Russia, JAXA of Japan, Canadian Space Agency and the European Space Agency.**
- **Each agency has a role to play and a share in the upkeep of the ISS.**
- **The station is divided into two sections:** the Russian Orbital Segment (ROS) is operated by Russia, while the United States Orbital Segment (USOS) is run by the United States as well as by the other states.
- The Russian segment includes six modules and the US segment includes ten modules.

- **Russia's part in the collaboration is the module responsible for making course corrections to the orbit of the ISS.**
- They also **ferry astronauts to the ISS from the Earth and back.**
- **Until SpaceX's dragon spacecraft** came into the picture the Russian spacecrafts were the only way of reaching the ISS and returning.
- The **station serves as a microgravity and space environment research laboratory in which scientific** research is conducted in astrobiology, astronomy, meteorology, physics, and other fields.
- It is **suited for testing the spacecraft systems and equipment required** for possible future long-duration missions to the Moon and Mars.
- The **ISS is the ninth space station to be inhabited by crews**, following the Soviet and later Russian *Salyut*, *Almaz*, and *Mir* stations and the American Skylab.
- It is the **largest artificial object in space and the largest satellite in low Earth orbit**, regularly visible to the naked eye from Earth's surface.
- It **maintains an orbit with an average altitude of 400 kilometers** (250 mi) by means of reboost maneuvers using the engines of the *Zvezda* Service Module or visiting spacecraft.
- **The ISS circles the Earth in roughly 93 minutes, completing 15.5 orbits per day.**

### **Role of Russia in maintaining the ISS-**

- According to the Russian Space Agency, Roscosmos, the Russian segment ensures that the space station's orbit is corrected to keep it away from space debris, roughly 11 times a year.
- Due to its enormous weight and the ensuing drag, the ISS tends to sink from its orbit at a height of about 250

miles above the Earth.

- It has to be pushed up to its original line of motion every now and then.
- The other reason for altering the path of the ISS is to avoid its collision with space debris, which can damage the station.
- In a year, 7-8 tonnes of fuel may need to be spent, with each maneuver costing nearly a tonne of fuel.
- If Russia backs out of the effort, SpaceX's dragon module and Boeing's Starliner can dock with the ISS. Starliner also has the capacity to carry, say, ten tonnes of fuel.
- Even if it crashes, the orbit of the ISS does not fly over the Russian territory mostly and places that are closer to the equator run a greater risk of it falling in their domain.