**CAREER OPTION**

# Astronaut – *A journey to the magnificent Universe*

# Every one of us has childhood fantasies about the career, about the life, but only some people can make those fantasies real. At least once in our life every one of us has looked up towards the infinite sky and wondered what mysteries it has kept from us. What secrets are hidden in this vast universe which is beyond our reach? Are we alone in this universe? Is there anyone like us somewhere in the space or someone different from us? Is there life possible on some planet other than earth? What are the secrets of the moon? Are the mysteries about aliens true? If you continue like this many interesting questions arise out of your curiosity.

# So to solve such endless mysteries of the universe and if you have a dream to see the space with your eyes in real, then don’t look back. The only career which can fulfill your dreams is being an astronaut. It is one of the toughest and most interesting career options where humans work beyond the earth. In this article, we will talk about the career path to be an astronaut. Whenever we talk about the word astronaut, the first thing that comes to our mind is NASA. The word alone is enough to give us goosebumps as it is the foremost space organization in the world. Every aspiring scientist has a dream to work with NASA and it is the perfect place for an aspiring astronaut.

# What is an astronaut?

# From the Greek words ástron means *star* and nautes mean *sailor,* the term “astronaut” is derived which means star sailor. It refers to everyone who was launched into space by various space agencies across the world. An astronaut who is also called as cosmonaut is a person who is trained by a human spaceflight program to pilot and command or serves as a crew member of a spacecraft. An astronaut is a person who travels into space for exploration work, for research work in the International Space Station or to repair satellites in space, to the moon and maybe to the other planets in the coming future.

# Who is this career for?

# A job as an astronaut, however, is not for everyone. A career as an astronaut is perfect for people who do not enjoy desk jobs. Adventurous people who love to explore the world would fit into this unique job instantly. An astronaut must have a natural scientific instinct, and have excellent observational skills along with hardworking nature. Training is an important part of this career. Astronauts are meticulously trained to conduct scientific research, as well as how to survive in various different environments. So one needs a lot of patience and should be ready to invest time and energy to become an astronaut. It should be a lifetime dedication.

# What do astronauts do?

# Any manned spacecraft which is launched into space is supported by the crew which consists of astronauts who perform specific duties.

**Mission Specialists**

Mission specialists are the people who are specially trained in a detailed way about onboard systems, mission requirements, various machines and their uses and operations and supporting equipment etc. For the coordination of operations among the crew who does planning, consumables usage and, payload operations, mission specialist takes this responsibility. They also perform extravehicular activities (EVAs), operate the remote manipulator system, spacewalks, and are responsible for payloads and specific experiment operations.

**Commander and Pilot Astronaut Duties**

The pilot astronaut performs the duty of commander and works as a pilot of Space Shuttle and International Space Station. During a mission, the onboard responsibility of vehicle, crew, mission success and safety of flight, rests on the shoulders of the commander. The pilot works as an assistant to the commander and helps in operating the vehicle. The pilot also assists the commander to deploy and retrieve the satellites utilizing the remote manipulator system and in other payload operations.

**Payload Specialists**

They are people other than NASA astronauts, who perform specialized onboard duties. They also include foreign nationals. They are added to the shuttle crew if there is a mission which requires more than the minimum crew size of five members. Among these additional crew members, the first priority is given to qualified NASA mission specialists. The sponsors from the other countries or the designated payload sponsor nominate the person as the additional payload specialist. These payload specialists are trained in specific fields as per the requirement.

* **Requirements to be an astronaut:**

**Pilot Astronaut/Flight Engineer:**

1. A candidate should complete graduation from an accredited institution in any of the streams whether it is engineering, biological science, physical science, or mathematics. And higher the education, better the chances of selection, so it’s always better to have a higher degree along with the minimum requirement. The quality of one’s academics also plays an important role.
2. One must have at least 1,000 hours pilot-in-command time in jet aircraft. Flight test experience is highly desirable.
3. Candidate should be the citizen of the country through which he/she is applying for the position of the astronaut. For example, if one wants to apply to the NASA astronaut selection, they should be the citizen of USA.
4. NASA conducts physical tests which are like military fight tests. The applicant must pass all these tests conducted by NASA. These tests includes the following specific standards:

* Blood pressure: 140/90 measured in a sitting position.
* Distant visual acuity: 20/100 or better uncorrected, correctable to 20/20 each eye.
* Height between 62 and 75 inches.
* Ability to work as a team member in an intercultural environment is of high importance.
* Able to spend long hours with oneself absorbed in a project.

**Mission Specialist:**

1. The Mission specialist educational requirement is same as for the pilot astronaut. In addition to the degree, they must have at least three years of professional experience related to the specified work. An advanced degree is beneficial and may be substituted for part or the entire experience requirement.
2. They should be able to pass NASA space physical tests which are similar to military or civilian flight physical tests

**Physical condition**

* The candidate must be free from any disease.
* It’s compulsory for all the candidates to have the normal range of motion and good functionality in all joints.
* They must be free from any dependency on drugs, addiction to alcohol or tobacco.
* The candidate must be free from any psychiatric disorders.
* Astronaut candidate should have efficient mental health, should be able to control their emotions which help them to work efficiently in any environment required.

If one wants to apply for NASA astronaut program then they should be the citizen of USA. If the candidates from other countries want to be the part of NASA astronaut program then they should start their career path from undergraduate degree onward. If they complete their graduation, post-graduation degrees and flight training in the USA they can have a chance to apply for astronaut selection program through NASA which is a pioneer space agency.

* **Best colleges where one can start their career as an astronaut:**
  1. California Institute of Technology
  2. Harvard University
  3. Massachusetts Institute of Technology
  4. Stanford University
  5. Princeton University
  6. **Purdue University-West Lafayette**
  7. **University of Colorado**
  8. **University of Washington**
  9. **University of Toronto**
  10. **University of Arizona**
  11. **University of Texas and many more**
* **Astronaut Selection and Training:**

**NASA releases applications for Astronaut Candidate Program once in a while.** Applicants for the Astronaut Candidate Program must meet the basic education requirements of NASA. Following the preliminary screening of applications, a week-long process of personal interviews, medical screening, and orientation are required for both civilian and military applicants under final consideration. Once the applicants are finalized, they are notified about the selection.

Selected applicants are designated as Astronaut Candidates and are assigned to the Astronaut Office at the Johnson Space Center (JSC) in Houston, Texas. The training period for all the selected Astronaut Candidates is of 2 years. During this time they will participate in the basic Astronaut Candidate training program, which is designated to develop the knowledge and skills required for formal mission training upon selection for a flight. Astronaut Candidates who are experienced in jet piloting maintain proficiency in NASA aircraft during their training.

As part of the Astronaut Candidate training program, candidates are required to complete military water survival before beginning their flying syllabus and become SCUBA qualified to prepare them for spacewalk training. During their first month of training, all Astronaut Candidates should pass a swimming test. They must swim 3 lengths of a 25-meter pool without stopping, and then swim 3 lengths of the pool in a flight suit and tennis shoes with no time limit. In addition to these rigorous training, the microgravity environment is created in a modified jet aircraft that produce periods of weightlessness for about 20 seconds before the aircraft returns to the original altitude. Astronaut Candidates are exposed to such environment to make them ready for the zero gravity atmospheres in the space and this sequence is repeated up to 40 times in a day.

Completion of all the above-mentioned training along with Robotics skills training, training in different foreign languages, and aircraft flight readiness training will mark the end of the Astronaut Candidate training program. Final selections will depend upon satisfactory completion of the training and evaluation period by all the Astronaut Candidates.

Candidates who successfully complete the training and evaluation along with nationality status are selected as astronauts. Candidates who are not selected as astronauts may be placed in other positions within NASA, depending upon the workforce requirements in the other departments.

**Astronaut Formal Training:**

After completion of the Astronaut Candidate training program, the selected astronauts begin their formal training program by reading training manuals along-side with computer-based training lessons about the vehicle systems and their mechanisms. After this, the next step in the training process is to train the astronauts about the various systems in the spacecraft. They are trained in such a way that they should be able to operate all the systems, recognize malfunctions, and to perform corrections if needed. Neutral Buoyancy Laboratory (NBL) provides controlled neutral buoyancy operations in the facility water tank to simulate the zero-g or weightless condition that is experienced by the crew during space flight.

The training facility provides important pre-flight training for the astronauts which makes them familiar with the crew activities and with the moment of the body under zero gravity conditions in order to perform spacewalks. Astronauts, who are pilots, maintain flying proficiency by flying 15 hours per month in NASA’s fleet of two-seat T38 jets. Non-pilot astronauts fly a minimum of 4 hours per month. This training program is designed to prepare astronaut personnel to travel to the International Space Station and to carry out various research activities there.

* **Salary Prospects:**

Astronauts are paid by the government of the country they work in and hence are on government pay scales. Most astronauts in the USA start at earning $50,000 at the early stage of their career. Experienced astronauts can earn around $120,000 per annum. Astronauts working in developed countries earn all kinds of extra benefits, including health and life insurance. They may also get paid vacations.

* **Life of an Astronaut:**

Astronauts work in the places where most of the humans cannot even imagine of going. Being an astronaut is the most amazing experience in one’s life. Astronauts are involved in all aspects of on-orbit operations like extravehicular activities (spacewalks), robotic operations using the remote manipulator system, and onboard maintenance tasks of the International Space Station (ISS).

Astronauts are required to have a detailed knowledge of the space station systems. Long duration missions abroad the space station generally last from 3 to 6 months. For long-duration missions training is very vigorous and takes approximately 2 to 3 years beyond the initial training and evaluation period. Astronaut training is a long duration training which also includes travel to other countries for training purposes.

Becoming an astronaut is a lifelong dream for many but very few people actually fulfill this dream. They become national heroes and common household names. Astronauts are well-respected people globally. The research done by the astronauts is very important to humans which leads to new groundbreaking discoveries in the largely unexplored outer space. Famous Indian origin astronauts who are the inspiration for the people of India who aspires to become an astronaut are, Rakesh Sharma the first Indian in the space, Kalpana Chawla the first Indian woman in space, Sunita Williams the woman who holds the record for the longest single spaceflight and also the record of seven spacewalks. So if these people achieved their dream then you also can achieve it. It’s not humanly impossible. What a student must keep in mind is anyone can make it through if they are determined to. Finally, perseverance pays off!