EducationWorld
THE HUMAN DEVELOPMENT MAGAZINE

CAREER FOCUS

Aerospace engineering

With Mars Orbiter having created history by vaulting India into the elite club of outer space nations, the demand for aerospace engineers is likely to zoom in the near future

"MARS ORBITER, INDIA'S FIRST interplanetary mission engineered by the Indian Space Research Organisation (ISRO) has created history with India joining an elite club of outer space nations comprising the US, Russia and China. With several deep space missions in the offing, the demand for aerospace engineers is likely to double within the next five years," says Dr. N.G.R. Iyengar, pro vice chancellor of Jain University and director of the International Institute of Aerospace Engineering and Management (IIAEM, estb. 2006), Bangalore.

Aerospace engineering is a science which focuses on research, design, development, construction, testing, science and technology of aircraft and spacecraft. It is further divided into aeronautical and astronautical engineering. The former deals with aircraft operating in the Earth's atmosphere and the latter with aircraft venturing into outer space.

To qualify as an aerospace engineer, aspirants should be well versed with the basic principles of aerodynamics, aerospace structures, flight mechanics and control, propulsion, avionics, meteorology, airworthiness regulation and air traffic control and management.

Aerospace engineering study programmes at the advanced diploma, bachelor's, Master's and Ph D levels are offered by mechanical engineering departments of several universities and specialised technology institutes, some of whom offer degrees in space-focused astronautical engineering as well.

Among the well-known institutions offering aerospace study programmes at the graduate and postgraduate levels, are the Indian Institute of Science (IISc), Bangalore and IITs at Kanpur, Chennai, Mumbai and Kharagpur. Some universities also offer aerospace engineering at the undergraduate level. In addition to undergrad, postgrad and research programmes, Jain University's IIAEM offers a Masters programme to engineers employed in the aviation and related industries as also research establishments to upgrade their skills. Likewise, the ISRO-sponsored Indian Institute of Space Science and Technology, Trivandrum (estb. 2007), offers undergraduate and postgraduate aeronautics, astronautics and space science courses. Distance learning programmes in aerospace engineering were introduced by IGNOU in 2009. For those interested in studying abroad, America's globally renowned National Aeronautics & Space Agency (NASA) offers advanced programmes in aerospace engineering.

Aerospace engineers are in great demand in the civil aviation and defence sectors, Indian Air Force, ISRO and other research organisations such as DRDO, National Aeronautical Laboratory etc as also in higher education institutions. Inevitably, pay packages are handsome ranging from Rs.35,000 for freshers to Rs.3-4 lakh per month for experienced professionals. The demand for India-trained aerospace engineers is sustained. Indian engineers constitute a significant percentage of technical professionals in NASA.

Dr. Iyengar: huge growth potential

"India is poised to become the world's third largest market for aircraft by 2020 with 1,800 aircraft flying Indian skies, transporting 400 million passengers per year. The Union government's planned investment of $12.1 billion (Rs.73,810 crore) in the airports sector during the 12th Plan period, of which $9.8 billion is expected to flow from private sector enterprises engaged in the construction of new airports, expansion and modernisation of existing airports etc, will give a massive thrust to employment in the civil and aerospace engineering sectors. According to the management consultancy firm Ernst and Young, the Indian MRO (maintenance, repair and overhaul) industry of the aviation sector will attract investment of $30 billion (Rs.183,000 crore) by 2020," says Dr. Iyengar, a nationally celebrated academic whose focus areas are structural analysis, composites, vibrations, buckling and optimisation.

AN ELECTRICAL ENGINEERING GRADUATE of Sagar University with a Masters in aeronautical (structures) engineering from the Indian Institute of Science, Bangalore, Dr. Iyengar pressed on to acquire a Ph D in aeronautical engineering from IIT-Kanpur where he taught the subject for almost four decades before signing up with Jain University and its International Institute of Aerospace Engineering and Management in 2007. IIAEM was promoted as a collaborative venture of the Society of Indian Aerospace Technologies and Industries and Jain University.

"The institutional objective of IIAEM is to produce engineering professionals skilled in aircraft design, manufacture and maintenance, airport design, construction and aviation business management through our undergrad, postgraduate and research programmes. Within the next few years, IIAEM will develop into a world class institute of aerospace education and research," predicts Iyengar.

Looking ahead to the future, Dr. Iyengar is bullish about the growth and development of India's aviation and aerospace sectors. "Aerospace engineering is one of the most technologically advanced and exciting branches of engineering. It is beginning to attract youngsters who have become aware of the huge potential of civil and defence aviation and space industries. This futuristic sector offers challenging innovation opportunities to engineers who aspire to be in the vanguard of science and technology," says Iyengar.

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