

# Aeronautical Engineering

What it means to be an Aeronautical Engineer!

Gajendra Circle Initiative (GCI) from IIT Madras Alumni Association and The Hindu Group

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# Introduction

Aeronautical / Aerospace Engineering is one of the most challenging fields of engineering with a wide scope of growth. This field deals with the development of new technology in the field of aviation, space exploration and defense systems. It specializes in designing, construction, development, testing, operation and maintenance of both commercial and military aircraft, spacecrafts and their components as well as satellites and missiles.

As Aerospace engineering involves design and manufacture of very high technology systems, the job requires manual, technical as well as mechanical aptitude. Aeronautical engineers usually work in teams under the supervision of senior engineers, bringing together their skills and technical expertise. Though highly paid, the work is very demanding. An aeronautical engineer needs to be physically fit and fully dedicated to his work. One needs to be alert, have an eye for detail and a high level of mathematical precision to be successful.

The specializations include areas such as structural design, navigational guidance and control systems, instrumentation and communication, production methods or it can be in a particular product such as military aircrafts, passenger planes, helicopters, satellites, rockets etc. Engineers may work in areas such as design, development, and maintenance as well as in managerial and teaching posts in institutes. They find great demand in airlines, aircraft manufacturing units, air turbine production plants or design development programmes for the aviation industry. Aerospace environment is sophisticated with rewarding career opportunities involving leading-edge technology.

# What You Learn in Aeronautical Engineering?

Aeronautical engineering curriculum covers the following major topics:

- Mathematics
- Fluids and solids
- Thermodynamics
- Avionics
- Aerodynamics
- Control Systems
- Fundamentals of Propulsion
- Electronics
- Automatic Control Guidance
- Theory Of Aerodynamics
- Structural Analysis
- Materials Science
- Fluid Dynamics

# **Opportunities**

Aeronautical Engineering is one of the most technologically advanced branches of engineering. The main thrust of this branch is on design and development of aircrafts, space and satellite research. Jobs are available with national, international, public and private Airline Services as well as aircraft-manufacturing units.

Initially, candidates work as graduate engineer trainees or junior Engineers. Keeping in view their performance, academic background and aptitude, they are placed for training in the aircraft maintenance/overhaul or support section. On completion of training they are placed as assistant aircraft engineers or assistant technical officers. They have to clear departmental examinations for further promotions. They may advance to administrative or executive positions or become consultants. Aeronautical engineers are assisted by aircraft mechanics in maintenance of aircraft frame, engine, Aeronautical system and other ancillary fittings.

**Scope in India -** In India aeronautical engineers are mostly employed by ISRO (Indian Space Research Organization) and the Ministry of Defense (MoD). One can also look for jobs available with the Civil Aviation Department, National Aeronautical Laboratory (NAL), Defense Research and Development Laboratories (DRDO) and Hindustan Aeronautics Limited (HAL), besides commercial airlines.

**Scope Abroad -** A lot of job opportunities for aeronautical engineers are also available in countries like United States of America, France, UK and Germany. Therefore, aeronautical engineers from India as well as from all other parts of the world flock to these countries. A good percentage of Indians constitute the work force of engineers and technical professionals in NASA.

More career opportunities can be found with:

- Many leading aerospace employers
- The Armed Forces
- Government departments such as the Department for Trade and Industry (DTI), and the Department for Environment, Transport and Regions (DETR)
- Agencies like the Defence Evaluation and Research Agency (DERA) and Defence Procurement Agency (DPA)
- Regulatory authorities like the Civil Aviation Authority (CAA)
- Small and medium employers (SMEs) who provide technical services or manufacture specialist products to supply to the aerospace industry

# **Salary Profile**

This section provides salary profile of aeronautical engineers in India based on years of experience, city of employment and type of employer.

#### Salary Range for Aeronautical Engineers (by years of experience) No enough data available.



#### Salary Range for Aeronautical Engineers (by City)

Salary Range for Aeronautical Engineers (by Type of Employer)



#### **Popular Industry & Salary Range**



# Areas of Research in Aeronautical Engineering

Aeronautical Engineering is immensely important in the present day world. During the past 100 years aeronautical pioneers have revolutionized the world. They developed the airplane by virtue of which the world has shrunk into a global village. There are a large number of jobs available in the field of Aeronautics and many aerospace companies are always on the lookout for good aeronautical engineers. Since Aeronautical engineering is a highly specialized field, an aeronautical engineer's salary is higher in comparison to other engineers. Aeronautical engineering is an immensely exciting field in which solving problems related to the science and technology of aircrafts and other flying vehicles is a must. Designing **unique** solutions to problems is the most challenging part of the job. An aeronautical engineer has vast research opportunities in both government and private industries. Aeronautical Engineering offers options in terms of roles such as technical or managerial as well as immense growth in the aerospace industry.

# Reference

This report has been compiled based on the following publications.

- http://en.wikipedia.org/wiki/Mechanical\_engineering
- www.winentrance.com

Aeronautical Engineering | 5/15/2010

- http://www.naukrihub.com/india/ http://www.winentrance.com/aeronautical\_engineering\_course.html
- http://afterbtech.com/aeronautical-engineering-scope-jobsprospects-skills-required.html
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- http://theknowledgeworld.com/world-of-aerospace/Aeronautical-Engineering.htm

# About Gajendra Circle

Gajendra Circle (GC) Initiative is a subset of IITM alumni association, and is aimed at building the IIT Madras brand and strengthening the Institute resources. It has been structured as a collection of city specific cells. GC Hyderabad was constituted in April 2010 with the aim to take up activities which strengthen IIT Madras and have a good resonance with the core team.

### **About Adayana**

Adayana is a leading Human Capital Development organization with its headquarters in Indianapolis, IN, USA and offices across Americas, EMEA, Asia. Adayana provides comprehensive learning services that leverage best-of-class and proprietary technologies and processes.

For four subsequent years, from 2006 to 2009, TrainingOutsourcing.com recognized us as one of the "Top 20 Companies in the Training Outsourcing Industry" for its unique and diverse capabilities. In 2007, 2008 and 2009 Adayana has been named to the Inc. 500 list of America's 500 fastest growing companies. Adayana offers e-Learning, instructor-led training, mobile learning, gameware and performance support tools to its customers for improving human capital performance.

Adayana India (based in Hyderabad) focuses on India and Asia markets - serving large multinationals in the Automotive, IT/ITES, Healthcare, Agriculture & Food and other verticals. Adayana is a leading player in skill development and capacity building and has partnered with leading universities and colleges to provide finishing school content to improve employability of students.

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