Metallurgy Engineering

What it means to be a Metallurgy Engineer!

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

May 15, 2010
Compiled by: Adayana Learning Solutions Pvt Ltd (www.adayana.com)
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Introduction
Metallurgical Engineering is a broad field that deals with all sorts of metal-related areas. The three main branches of this major are physical metallurgy, extractive metallurgy, and mineral processing.

Physical metallurgy deals with problem solving: you'll develop the sorts of metallic alloys needed for different types of manufacturing and construction.

Extractive metallurgy involves extracting metal from ore.

Mineral processing involves gathering mineral products from the earth's crust.

As a Metallurgical Engineering major, you'll learn the fundamentals of all three fields, as well as the basics of engineering in general. We need metals to make our society function—metals make up important parts of cars, bikes, planes, buildings, even toothpaste tubes. Your knowledge of the production, design, and manufacturing of these metals and mineral products can be rewarding and exciting.

Most Metallurgical Engineering programs will offer the opportunity to participate in a cooperative education program, an arrangement in which students spend a semester or more doing engineering work with a metallurgical company. Many of these co-op jobs can become actual jobs after graduation, and the experience will make you a more valuable prospective employee.

What You Learn in Metallurgy Engineering?
The main areas of study in Metallurgy Engineering are:

- Basic Hydrometallurgy
- Basic Physical Metallurgy
- Basic Pyrometallurgy
- Corrosion
- Electrometallurgy
- Flotation
- Heat treatment of steels
- Hydrometallurgy
- Literature survey
- Mechanical metallurgy
- Metallurgical analysis
- Minerals processing
- Physical metallurgy
- Pyrometallurgy
- Refractory materials
- Welding metallurgy
Opportunities

Metallurgical engineering graduates looking for jobs need to have an open mind and not limit themselves only to positions that are commonly heard of and blatantly popular. Sometimes thinking outside the box is needed in order to land superb metallurgical engineering jobs in fields and areas that others have not thought of and put your specialized training to practical use. Such positions usually offer the most remuneration and it is your creativity that can open up new doors. In this article, we will address one such opportunity, namely metallurgical engineering technical writing jobs.

Many industries have a need for someone to write up technical process sheets and technical bulletins dealing with specific requirements for alloy design, chemistry control, materials quality control procedures, corrective actions for quality issues, materials specifications and many such internal documents. Companies that are in the cutting edge of research and development are also in need of people that can take a set of experimental data and convert it to a research publication paper format. Marketing departments of various metallurgical companies are in need of people that can write technical articles in various industry magazines with a slant on selling their products.

Such situations really call for the presence of someone who is metallurgically well trained, but is also well versed in language and communication. If you have a good command over language and can convert sophisticated technical jargon into easily understandable documentation, then metallurgical engineering technical writing jobs are something you ought to take a look at. Take up a few courses in technical writing and communication; you can take on some internships at industry publishing houses and may be even start a blog where you can show off your technical writing skills in order to land the perfect metallurgical engineering technical writing job.

Such jobs are usually in a clean working environment and can provide fairly good salaries and benefits. But as we have discussed above, sometimes looking at places that others have not looked at may be the best way to locate new opportunities.
Salary Profile
This section provides salary profile of Metallurgy engineers in India based on years of experience, city of employment, type of employer.

Typical Salary Data for Metallurgy Engineers (by years of experience)
Not enough data available

Typical Salary Data for Metallurgy Engineers (by City)
Not enough data available

Typical Salary Data for Metallurgy Engineers (by Type of Employer)
Not enough data available

Gender Profile
Not enough data available

Areas of Research in Metallurgy Engineering
Materials science or materials engineering is an interdisciplinary field involving the properties of matter and its applications to various areas of science and engineering. This science investigates the relationship between the structure of materials at atomic or molecular scales and their macroscopic properties. It includes elements of applied physics and chemistry. With significant media attention focused on nanoscience and nanotechnology in recent years, materials science has been propelled to the forefront at many universities. It is also an important part of forensic engineering and failure analysis. The material science also deals with fundamental properties and characteristics of material.

Materials Science broadly encompasses the fundamental study of solid matter with the goal of engineering new materials with superior properties, and ultimately enabling altogether new types of devices. Historically, materials science focused on metallurgical and ceramic systems, and the state of technological achievement of ancient (European) societies has been described in terms of materials – the Stone Age, the Bronze Age and the Iron Age. In the modern era, Material Science makes use of advanced fabrication and characterization tools that allow us to observe and manipulate matter virtually atom by atom. The field is inherently interdisciplinary, with strong connections to physics, chemistry, biology and the engineering fields. Materials scientists tackle such problems as the discovery of efficient electrolytes and electrodes for batteries and fuel cells (for sustainable energy), the design of nanoscale structures that can use light for communication (photonics), and the fabrication of high strength metals free of traditional failure modes (bulk metallic glass). In each case, tackling such problems requires fundamental thermodynamic and kinetic insights to answer the question: why do materials behave the way they do?

Reference
This report has been compiled based on the following publications.
- [http://metallurgicalengineeringjobs.blogspot.com](http://metallurgicalengineeringjobs.blogspot.com)
- [http://www.met.iitb.ac.in/Main/aboutUs/future.html](http://www.met.iitb.ac.in/Main/aboutUs/future.html)
- [http://www.payscale.com/research/IN/Job=Aeronautical_Engineer/Salary/by_Industry](http://www.payscale.com/research/IN/Job=Aeronautical_Engineer/Salary/by_Industry)
- [http://www.payscale.com/research/IN/Degree=Bachelor_of_Science%2c_Metallurgical_Engineering_(BSMet)/Salary/by_Employer_Type](http://www.payscale.com/research/IN/Degree=Bachelor_of_Science%2c_Metallurgical_Engineering_(BSMet)/Salary/by_Employer_Type)
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 our 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

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