



Titanium: History , Science , Extraction , Processing , Technology and Applications

Dr. Sam Froes

**Short Course: 27 Nov 2011, Fiesta Americana Condesa All
Inclusive Resort, Cancun, Mexico**

Learn about the History, Science, Extraction, Processing, Technology and Applications of Titanium. The 65 year history of Titanium will be presented from the development of the Kroll process to the present day status of this “wonder” metal. The commercial Kroll process for the extraction of Titanium will be presented along with newly developing more cost effective techniques. Processing of Titanium via the conventional mill products route will be discussed along with the potentially more cost effective powder metallurgy approach .The various aspects of Titanium technology will be presented along with current and future applications, which depend in large part on cost reduction of this metal.

Who Should Attend

This course would be beneficial to all those currently involved in the various aspects of titanium science and technology and those contemplating getting involved. This includes those from academia and those from industry including personnel involved in management activities, production aspects, marketing and sales.

Course Outline

This course on Titanium is designed to develop a better understanding of the various aspects of Titanium science and technology and to provide a perspective of the history and potential future of this metal.

Topics Include :

- History of Titanium
- Extraction of Titanium – both conventional (Kroll) and newly developing techniques
- Physical metallurgy of Titanium





- Phase diagrams and principles of alloying Titanium
- Deformation and Recrystallization of Titanium
- Mechanical properties of Titanium
- Metallography of Titanium and its alloys
- Melting, casting and powder metallurgy of Titanium
- Primary and secondary (part production) working of Titanium
- Joining and machining of Titanium
- Corrosion aspects of Titanium
- Applications of Titanium – both Aerospace and non-aerospace

The participants will also receive:

- ◆ CD with course material
- ◆ Certificate of Completion
- ◆ A copy of the Instructors recent publications on Titanium
- ◆ Lunch and Refreshments



Course Instructor Dr. Sam Froes

Dr F.H. (Sam) Froes has spent more than 40 years working on all aspects of Titanium Science and Technology including more than 10 years at a primary producer and the same amount of time with the US Airforce Materials Laboratory. He recently retired from the University of Idaho where he was Department Head of the Materials Science Department and Director of The Institute for Materials and Advanced Processes. He has published more than 800 technical papers, has more than 60 patents and has edited almost 30 books. He is a Fellow of The American Society for Materials and a member of the All Russian Academy of Natural Sciences.

REGISTRATION: <https://www.flogen.com/FraySymposium/registration.php>

