

What is Mining Engineering?

Humans have used almost every type of resource that can be found on or near the surface of the earth for tens of thousands of years. And almost all have been based on rocks. From the weathering of rocks we get soil for

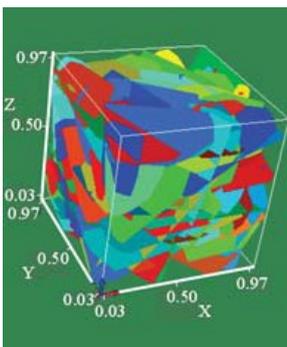
agriculture. From whole rocks, we've built our cities and our monuments and great works of art (think granite, marble and sandstone – the Red Pyramid of Egypt, Michelangelo's David, the US White House).

The basis of our civilisation

Our lives and the way we live them depend on rocks and the mining of rocks, and always have. Along with

agriculture, mining is the very foundation, the very bedrock of our civilisation. From the mining of rocks, we've extracted all the materials that have advanced human civilisation, such as iron, coal, copper, tin, quartz and aluminium.

- Iron ore to make steel, which is used in up to 95% of all metal manufacturing every year.
- Coal, a combustible rock, is the major source of energy for the production of electricity worldwide (and, unfortunately CO₂ emissions, but we're working on that)
- Copper mining gives us copper for copper wire to carry electricity, for electromagnets and printed circuit boards, as well as brass for sculptures.
- Tin, for soldering, for making bronze and pewter.
- Quartz, the origin of silica sand for making glass, and silicon for making computer chips.
- Aluminium, the most widely used non-ferrous metal in the world, from which we make cans, bicycles, windows, doors, siding, cooking utensils, airplanes, and the list goes on and on.
- Then there are the precious metals, like gold, mined for jewellery, for money and for use in electronic gadgets, among other things. And precious rocks, like diamonds for use in jewellery (looking very nice with gold!), and also industry.



Rock is a very interesting material. After hundreds of millions of years of geological changes it becomes a highly heterogeneous fractured media (see right). Rock fractures therefore play a very important role in mining engineering. The ways in which rock can fracture are important when constructing a mine, and extracting minerals, oil or gas from the ground.

A typical mobile phone contains 9% aluminium, 19% copper, 8% iron, 1% nickel and 1% tin. It has been estimated that by the end of 2010, there will be 2.7 million youths aged between 10 and 19 years in Australia. To make each a mobile phone would require 30 tonnes of aluminium, 63 tonnes of copper, 27 tonnes of iron, 3 tonnes of nickel and 3 tonnes of tin.

The rewarding, complex role of the mining engineer

Mining engineering is a career that gives you the opportunity to contribute to human society and human wellbeing, and to technological advances in dozens of industries dependent on the products derived from mining.

No matter what is being extracted, whether diamonds or coal, as a mining engineering graduate you will have the opportunity to be involved in every stage of a mining operation, from the point of discovery to the closing of the mine.

The program of study for mining engineering students is very varied. First and foremost, you will be an engineer. Mining will be your speciality. Courses can include: mine design, environmental management, resource estimation, safety management, mining economics and finance, geology, rock excavation engineering, as well as aspects of electrical engineering, civil and mechanical engineering.

You must be an exemplary communicator, because you will be involved in the design, supervision and management of the mine. Mining engineers' responsibilities include planning the safest and most cost effective way of getting the minerals out of the ground. You may assist with the design, installation and supervision of the use of mining machinery, and inspect the mine to monitor progress.

