

## Career Profile: Rock Engineer

Mining activity involves working with rock which is not the same everywhere as rock has variable properties and often behaves in unpredictable ways. The role of a rock engineer is to predict and control rock behaviour and to design practical, cost effective and safe mining systems which are practical, cost effective and safe. What distinguishes the rock engineer from other engineering disciplines which design and construct structures and machines, is the work with rock.

If the rock engineer fails to understand and control the behaviour of the rock underground, conditions could become unsafe and work there may not be possible. A rock engineer who understands how different rocks behave in varying conditions and knows how to moderate this behaviour through innovative and technically sound designs is a real asset to the company.

The rock engineer makes a contribution through all the phases of the mining cycle. At the feasibility phase, s/he has to answer questions about whether a safe and economically viable mine can be designed to extract the ore. During the planning and operation phase rock engineers provide information to the mine design team which is critical in designing suitable access and in excavating the ore itself.

## Education Requirements

### National Senior Certificate (NSC)

For a career in rock engineering students are advised to select Science and Mathematics and to add to this a selection from the designated subjects. These are subjects that are particularly suitable for tertiary study.

### Bachelor Degree

Bachelor of Science (Geology) – (3 years). A three year degree programme in Geology.

#### Offered at:

- [University of Johannesburg](http://www.uj.ac.za/mining/Home/tabid/1764/Default.aspx)<sup>1</sup> (Department of Mining Engineering)
- [University of Pretoria](http://web.up.ac.za/default.asp?ipkCategoryID=2048)<sup>2</sup> (Department of Geology)
- [University of the Witwatersrand](http://web.wits.ac.za/Academic/EBE/MiningEng/)<sup>3</sup> (School of Mining Engineering)

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<sup>1</sup> <http://www.uj.ac.za/mining/Home/tabid/1764/Default.aspx>

<sup>2</sup> <http://web.up.ac.za/default.asp?ipkCategoryID=2048>

<sup>3</sup> <http://web.wits.ac.za/Academic/EBE/MiningEng/>

## National Diploma / BTech

Students who prefer a more practical approach can enrol for programmes to qualify in rock engineering at BTechnology and Diploma levels. Specializations are offered in these programmes.

The **National Diploma** is a three year course which includes guided practical experience. The diploma is a pre-requisite for admission to a Bachelor of Technology - BTech.

### Offered at:

- [Tshwane University of Technology](#)<sup>4</sup> (Department of Environmental, Water and Earth Sciences)
- [University of Johannesburg](#)<sup>5</sup> (Department of Mining Engineering)
- [UNISA](#)<sup>6</sup> (College of Science, Engineering and Technology)

### Specializations offered:

There are some National Diplomas and BTech degrees to consider.

#### **Tshwane University of Technology**

**National Diploma:** Geology

**BTech:** Geology

#### **University of Johannesburg**

**National Diploma:** Mining engineering

**BTech:** Mining engineering

#### **UNISA**

**National Diploma:** Mining engineering

## Admission requirements

As admission requirements vary from one institution to another, find out what the specific requirements are by checking on the website and contacting the university if you have any queries.

## Possible Employers

- [Anglo American Corporation Limited](#)
- [AngloGold Ashanti](#)

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<sup>4</sup> <http://www.tut.ac.za/Students/facultiesdepartments/science/departments/environscience/Pages/default.aspx>

<sup>5</sup> <http://www.uj.ac.za/mining/StudyInformation/NationalDiploma/tabid/1771/Default.aspx>

<sup>6</sup> [http://brochure.unisa.ac.za/brochure/showprev.aspx?d=l\\_4\\_23&f=p\\_NDMIN](http://brochure.unisa.ac.za/brochure/showprev.aspx?d=l_4_23&f=p_NDMIN)

- [Anglo Platinum](#)<sup>7</sup>
- [BHP Billiton](#)<sup>8</sup>
- [De Beers Consolidated Mines](#)<sup>9</sup>
- [Durban Roodepoort Deep](#)<sup>10</sup>
- [Gold Fields Limited](#)<sup>11</sup>
- [Harmony Gold](#)<sup>12</sup>
- [Impala Platinum Limited](#)<sup>13</sup>
- [Ingwe Coal Corporation Ltd](#)<sup>14</sup>

## Find out more

Find out more about mining and careers for rock engineers:

- Useful [description of rock engineering](#)<sup>15</sup> and the levels of jobs leading up to Manager Rock Engineer.
- [Useful links to various aspects of mining.](#)<sup>16</sup>
- [Overview of the local coal mining industry.](#)<sup>17</sup>
- [New strategy for managing falls of ground in South Africa.](#)<sup>18</sup>
- [Explanation](#)<sup>19</sup> of a technique for reducing the incidence of face bursts and reducing the risk of injury to the miners working to develop a stope.

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<sup>7</sup> <http://www.angloplatinum.com/>

<sup>8</sup> <http://www.bhpbilliton.co.za/bb/home.jsp>

<sup>9</sup> <http://www.debeersgroup.com/Inside-De-Beers/Family-of-Companies/De-Beers-Consolidated-Mines/>

<sup>10</sup> <http://www.drd.co.za/>

<sup>11</sup> <http://www.goldfields.co.za/>

<sup>12</sup> <http://www.harmony.co.za/>

<sup>13</sup> <http://www.implats.co.za/business/impala.asp>

<sup>14</sup> <http://www.mbendi.com/orgs/cb23.htm>

<sup>15</sup> [http://www.angloplatinum.com/def\\_main.asp?Id=careers/c\\_careers\\_in\\_ap/c\\_careers\\_in\\_ap\\_rockengineer.asp&Related=true](http://www.angloplatinum.com/def_main.asp?Id=careers/c_careers_in_ap/c_careers_in_ap_rockengineer.asp&Related=true)

<sup>16</sup> <http://www.saeverything.co.za/mining.htm>

<sup>17</sup> <http://www.mbendi.co.za/indy/ning/coal/af/sa/p0005.htm>

<sup>18</sup> <http://www.anglogoldashanti.com/subwebs/InformationForInvestors/ReportToSociety06/FOGM.htm>

<sup>19</sup> <http://www.anglogoldashanti.com/subwebs/InformationForInvestors/ReportToSociety06/preconditioning.htm>

## Are you suited to this career?

This quick quiz can help you to identify whether you are suited for this occupation.

Quiz	Yes	No
Are you interested in the geological structure of the earth?		
Would you like to work in mining?		
Are you able to communicate well orally and in writing?		
Are you a keen observer?		
Do you have an enquiring mind and are you interested in solving problems?		
Are you well organized and do you work in a systematic way?		
Would you like to help make work safer for miners?		
Would you describe yourself as persuasive and persevering?		
Are you able to work well with others?		
Are you interested in learning various computer applications?		

If you have mainly yes answers it may be an indication that this is an occupation to consider.