Self-Help Guide
to my future career in
Science, Engineering & Technology

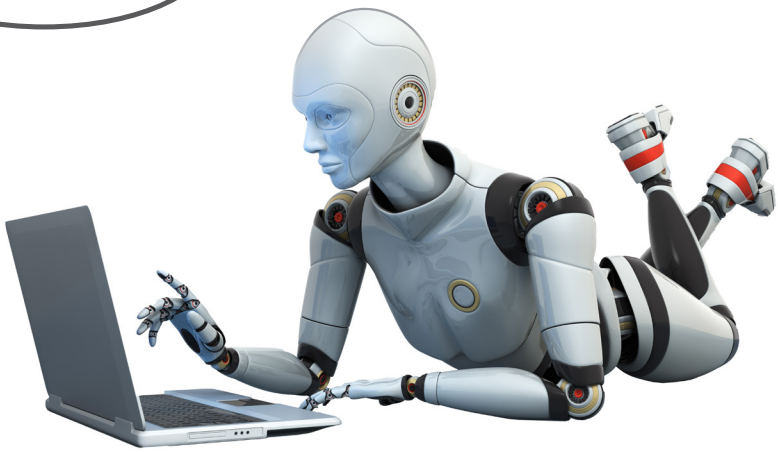
AM I SUITED TO A CAREER IN SCIENCE ?

WHICH FIELD OF SCIENCE AM I BEST SUITED TO ?

WHAT LEVEL OF STUDY SHOULD I COMPLETE ?

HOW DO I FINANCE MY STUDIES ?

WHAT ARE PROFESSIONAL BODIES ?



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NRF National Research Foundation | SAASTA South African Agency for Science and Technology Advancement

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To find out more information on your careers, role models and interesting features related to your career...

Look at the Department of Science, Engineering & Technology Careers Publication or go to www.dst.gov.za and click SET Careers

1. Self Assessment Questionnaire - "Who am I ?"

Which fields of Science are you best suited to?

Complete the career questionnaire below to help you to choose a field of science best suited to you.

Read through each statement and tick ✓ the ones that you like the most. Leave blank the ones that you do not like. There are 35 statements in all. Once you have finished, add up the total for each row and write the total out of 5 in the right hand column at the bottom of each set of questions. See example below:

EXAMPLE

	Tick ✓
Designing mechanical equipment	✓
Using geometry to design various products	
Using science to develop new products	✓
Managing construction projects	
Manufacturing and maintaining electrical equipment	✓
Total:	*3*

A

Designing mechanical equipment	
Using geometry to design various products	
Using science to develop or design new products	
Managing construction projects	
Manufacturing and maintaining electrical equipment	
Total:	

B

One of my best subjects at school is Physical Science	
Studying Chemistry	
Conducting experiments in a lab	
Solving complex mathematical problems	
Researching scientific problems	
Total:	

C

Studying the earth and its atmosphere	
Studying the earth, from earthquakes to raindrops, and from floods to fossils	
Studying other planets	
Collecting rocks, soil and water to conduct experiments	
Doing geography	
Total:	

Self Assessment Questionnaire - "Who am I ?"

D

	Tick ✓
Solving problems with the help of computers	
Writing computer programmes	
Designing and installing computer equipment	
Researching the latest computer technology	
Using mathematical models to design computers	
Total:	

E

Studying human anatomy	
Doing biology	
Studying physics and chemistry as part of a medical degree	
Treating people or animals with who are sick or injured	
Studying the causes of diseases	
Total:	

F

Studying chemical interactions that occur within a living cell	
Studying animal behaviour	
Studying organisms and microorganisms	
Doing environmental science projects at school	
Studying the processes of how an organism forms, from zygote to full structure	
Total:	

G

Studying the behaviour of individuals and groups	
Analysing political issues in a country	
Studying the culture and lifestyle of people	
Conducting public opinion surveys	
Reading books on people and events from the past	
Total:	

Add up your scores for each of the Science Fields and plot them on the Bar Chart on the following page.

2. Highest Scoring Fields - Bar Chart

Record your results!

Once you have added up your scores, colour in the bars for your scores for A - G. Then identify the field(s) with your highest score. There may be some fields where your scores are the same. Choose the field(s) which you like best of all!
Then read up on/research the types of careers that are related to the field(s) you like.

	FIELD	1	2	3	4	5
A	**Engineering Sciences**					
B	**Physical & Chemical Sciences**					
C	**Earth Sciences**					
D	**Computer Sciences**					
E	**Medical Sciences**					
F	**Life Sciences**					
G	**Social Sciences**					

Which were your highest fields?

1. _____

2. _____

3. _____

3. Find out more information on Careers

Choose a career that appeals most to you. Research this career. Use the internet or the Science Engineering & Technology Careers Publication to assist you in your research.

CAREER 1

1. Career Name: _____

1.1. What will I do in this career? _____

_____

1.2. What tools or equipment will I use? _____

1.3. Work Environment – tick (✔) in the relevant blocks.

Work outdoors ☐ Work indoors ☐ Work in an office ☐

Work in a laboratory ☐ Work in a classroom ☐ Work in consulting rooms ☐

1.4. What are the personality requirements?_____

1.5. What are the subjects I need to take at school?

Compulsory Subjects	Recommended Subjects

1.6. Where can I study this career? Tick (✔) in the relevant block(s).

University ☐ University of Technology ☐

TVET College ☐ Private College ☐ Other ☐

1.7. Who are the possible employers for this career?

_____

1.8. Name careers that are related or similar to this career.

_____

1.9. What can I do to get started? (Make a list of things to do and people to contact)

_____

_____

_____

_____

Find out more information on Careers

Choose another career that appeals to you. Research this career. Use the internet or the Science Engineering & Technology Careers Publication to assist you in your research.

CAREER 2

2. Career Name: _____

2.1. What will I do in this career? _____

_____

2.2. What tools or equipment will I use? _____

2.3. Work Environment – tick (✔) in the relevant blocks.

Work outdoors ☐ Work indoors ☐ Work in an office ☐

Work in a laboratory ☐ Work in a classroom ☐ Work in consulting rooms ☐

2.4. What are the personality requirements?_____

2.5. What are the subjects I need to take at school?

Compulsory Subjects	Recommended Subjects

2.6. Where can I study this career? Tick (✔) in the relevant block(s).

University ☐ University of Technology ☐

TVET College ☐ Private College ☐ Other ☐

2.7. Who are the possible employers for this career?

_____

2.8. Name careers that are related or similar to this career.

_____

2.9. What can I do to get started? (Make a list of things to do and people to contact)

_____

_____

_____

_____

Find out more information on Careers

Choose a third career that interests you and research it. Use the Internet or the Science Engineering & Technology Careers Publication to assist you in your research.

CAREER 3

3. Career Name: _____

3.1. What will I do in this career? _____

_____

3.2. What tools or equipment will I use? _____

3.3. Work Environment – tick (✔) in the relevant blocks.

Work outdoors ☐ Work indoors ☐ Work in an office ☐

Work in a laboratory ☐ Work in a classroom ☐ Work in consulting rooms ☐

3.4. What are the personality requirements?_____

3.5. What are the subjects I need to take at school?

Compulsory Subjects	Recommended Subjects

3.6. Where can I study this career? Tick (✔) in the relevant block(s).

University ☐ University of Technology ☐

TVET College ☐ Private College ☐ Other ☐

3.7. Who are the possible employers for this career?

_____

3.8. Name careers that are related or similar to this career.

_____

3.9. What can I do to get started? (Make a list of things to do and people to contact)

_____

_____

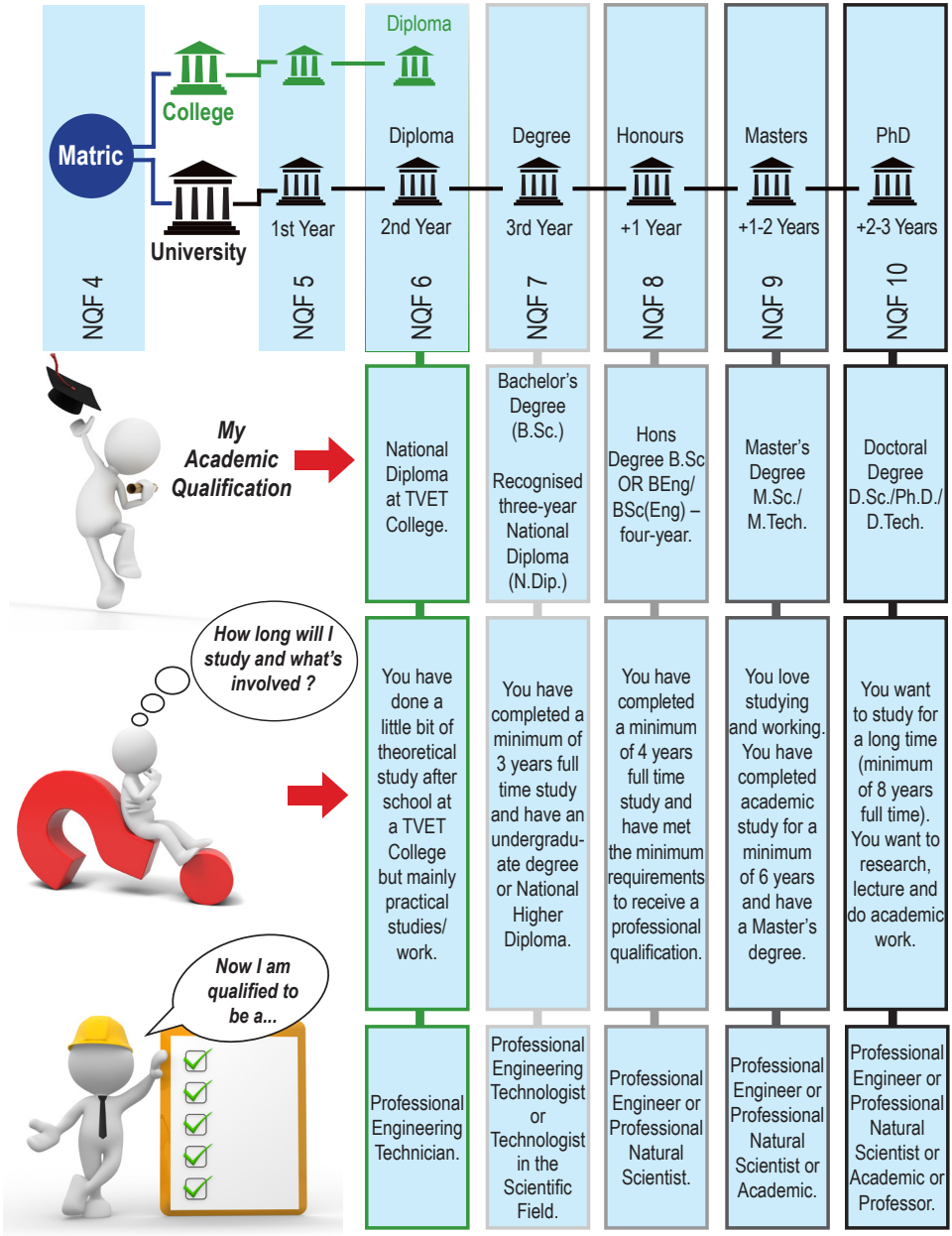
_____

_____

4. Levels of Study

The National Qualification Framework (NQF) consists of 10 levels. All qualifications are graded according to the NQF levels, each level signifying a specific standard of intellectual and academic skills. As a general rule of thumb the higher the NQF level, the more academic knowledge required. ***So, what level suites you best?***

The diagram below indicates the levels of study available within the Engineering and Scientific Fields:



5. What Level of Profession do I want to achieve?

What is a Profession?

We all rely on the professionals in our everyday lives, from doctors to engineers, from pharmacists to scientists. Professionals in the fields of engineering, science or medical science are required to study an accredited qualification and practical internship before going into independent practice. All professionals are regulated and registered with a Professional Body which set the standards for practice.

In order to practice as an engineer, scientist or medical practitioner, it is compulsory for you to be registered to practice by a professional body or an association representing your discipline. A statutory body means a body or association formed through an act of the Parliament or the State Legislation. Standards and codes of conduct are regulated by law and these are supervised by professional bodies or councils for each field or discipline.

ENGINEERING

To become an Engineer, you need to be registered with the Engineering Council of South Africa (ECSA)
The Engineering Council of South Africa (ECSA) is responsible setting the educational and professional development standards and registering professional engineers. This is done in accordance with the Engineering Profession Act, 2000 (Act No 46 of 2000).

The Engineering Council of South Africa (ECSA) recognises 4 categories of engineer:

- Professional Engineering Technician (Pr Eng Techni)
- Professional Engineering Technologist (Pr Tech Eng)
- Professional Certificated Engineer (Pr Cert Eng)
- Professional Engineering (Pr Eng)

Engineering	Engineering Council of South Africa (ECSA)	www.ecsa.co.za	011 607 9500

NATURAL SCIENCES

In order to practice as a Natural Scientist, it is mandatory to be registered with South African Council for Scientific Professions (SACNASP). This is done in accordance with the Natural Scientific Professions Act, 2003 (Act No. 27 of 2003) (Sections 18 (1) and 20(2)(a).

SACNASP recognises 3 categories of natural scientist:

- Certificated Natural Scientist
- Candidate Natural Scientist
- Professional Natural Scientist

Natural Sciences	South African Council for Natural Scientific Professions (SACNASP)	www.sacnasp.org.za	012 748 6500

MEDICAL & VETERINARY SCIENCES

All medical practitioners working in their respective fields of practice are mandated to register with the HPCSA as a pre-requisite for professional practice. Qualifying in any of the health care professions is an important personal responsibility and, as a practitioner, there are several legal obligations. There is a detailed reference guide for the registration requirements for each of the 12 Professional Boards:

Medical Sciences	Health Professions Council of South Africa (HPCSA)	www.hpcsa.co.za	012 338 9300

6. How To Finance Your Studies?

One of the biggest factors affecting the career choice of young people today is funding for study.

The good news is that the gates of learning are not closed to financially needy students! This is especially true if you have achieved good marks in maths and science at school. Financial aid is provided in different forms by way of bursaries, scholarships or incentive schemes. Read through the options below and check whether you may be eligible for financial aid.

Bursaries:
A bursary is an amount of money granted to a student for the purposes of study. Bursaries are granted on the basis of academic performance, financial need and other requirements. They are usually not paid directly to the student but are administered by a trust or body set up for this purpose. The terms of the bursary will vary from bursary to bursary. Contract bursaries require that the student "pay" for the bursary by working for the bursary provider on completion of studies.

Scholarships:
A scholarship is an amount of money granted to a learner on the basis of outstanding academic or other achievement in a defined field of study. A scholarship is therefore a type of bursary. The word scholarship is often used when referring to international study.

University Discounts & Incentives:
Many institutions offer incentive schemes in order to attract learners with high academic, sporting and leadership potential. Academic incentives are provided on the basis of school marks. To find out more about incentives contact the Financial Aid Office of the institution to which you are applying.

Student Loans:
Most young people do not qualify for a bursary and need funding by way of a loan to pay for their studies. Student loans are offered by banking or other institutions for the purpose of paying for studies. Student loans must be repaid once you have graduated. Most banks require you to pay back your student loan over the same number of years that it took to complete your studies and loans must be paid back with interest. Most banks will require some form of surety or security before they grant a student loan. This means that a relative, friend or sponsor must guarantee to repay the loan if you do not. Some banks will also require the person who signs surety for your loan to pay the interest on your loan while you are studying.

The National Student Financial Aid Scheme (NSFAS)

There is a perception that people from poor homes will never be able to study after school. This is not true! The National Student Financial Aid Scheme of South Africa (NSFAS) is financial aid system that enables academically deserving and financially needy students to study.

The student receiving a loan from NSFAS must pay back the capital and interest on the loan. However, interest charged is less than that charged by the commercial banks. To find out more about incentives contact the Financial Aid Office of the institution to which you are applying.

The first step in the process is for the student to apply to and be accepted by a university, university of technology or TVET college. Applications must be made via the institution's Financial Aid Office or Student Support Centre. Visit, www.nsfas.org.za for more information.

With freedom comes responsibility

Nndwelenil matriculated at Ithuteng Secondary school in 2012, top of his class. He received a bursary from GCRA to study B.Sc. Mathematical Sciences at UJ. The bursary was worth R50 000 at the time, it covered tuition fees, books, food and accommodation.

"I chose B.Sc. Mathematical Sciences because of the love for mathematics and science. I started my first year away from home, the new environment came with the luxury of independence. I had to adapt and learn to be a responsible grown man. In 2015, I had my first fail academically, it was heart breaking. I lost my bursary and through support of family and friends I managed to complete my studies".

Nndweleni Wayne Sithagu

Big dreams, hard work and lots of family support

Thakane experienced many financial challenges while studying: "I got financially excluded after my first year and was home for the first month of second year. Towards the end of that month, my mother took my results to the Department of Environmental affairs in Free State and asked them to assist with my fees. I will forever be grateful to her and to the MEC. I did not have additional resources such as laptop and smartphone so I spent more time on campus doing more work than my peers with such resources. Throughout my postgraduate degree, I was a recipient of a bursary from Inkaba ye Afrika. The Inkaba ye Afrika bursary was co-funded by NRF, SA and BMBF Germany. During the last few years of my research, the same Inkaba ye Afrika bursary was funded solely by NRF".

Thakane Ntholi

Get a part-time Job!

In order to pay for her studies, Vhonani managed to get a student loan and she had 3 part-time jobs to make ends meet.

"There are many challenges which face students today. Students have to learn to do things for themselves and not rely on entitlement". Apply for funding, look out for opportunities, ask questions … show up and just be where things are happening instead of sitting and complaining about that which is not working all the time. Its all about having the right attitude and taking the opportunities that come up".

Vhonani Netshendama

Funding for post-graduate studies

"My family are not wealthy, so growing up there were financial challenges. Particularly when I got to University and wanted to do my post-graduate degree in Demography and my parents could not afford it. To overcome this, I studied really hard to secure a scholarship and worked on weekends at a furniture store to be able to study my Honours and Masters degrees. Thankfully the funding I received from the Consortium for Advanced Research and Training in Africa (CARTA) in my PhD was sufficient and I did not need the weekend job anymore. My advice to young people is: be prepared to make short-term sacrifices in order to achieve your long-term goals. The process of learning is challenging and time-consuming, but in order for you to be successful and achieve your goals, make the sacrifices now and later on these will pay off. ***Nicole de Wet***

7. Draw up a Financial Plan

It is **VERY IMPORTANT** to **REMEMBER** that paying for your studies should **NEVER** be an obstacle.
You must investigate all options and plan how you are going to achieve your goal.

Financing your studies

How do you plan to finance your studies? Make a cross in the relevant block. **X**

Parents		**Study Loan**		**Bursary**		**Other**	

Example of cost options for some study programmes and accommodation

Institution	**Study Programme**	**Cost Of Study**	**Cost Of Accommodation (If Required)**	**Total**
Wits	BSc	R47 920	R49 872	R97 792
UP	BEng (Civil Eng)	R48 000	R49 000	R97 000
UWC	BPharm	R35 700	R25 910 (excl meals)	R61 610
UKZN	B Agriculture	R40 200	R49 872	R90 072

These figures are estimated costs in order to illustrate that costs structures differ among institutions and cities/towns

Financial Aid

Investigate bursary and study loan opportunities by referring to the Financial Aid Guide (only to be completed if you meet the entry requirements). Note: Most bursaries require high marks, especially in Maths and Science.

Bursaries

Study field		**Requirements of bursary**	
Bursary name		**Duration of bursary**	
Value of bursary		**Who Can Apply?**	
Where to study (Institution)		**Closing date**	
Service Contract with company (if applicable)		**Do I qualify?**	
Address			

Investigate study loans

List three institutions (banks or other) where you can obtain student loans. List their contact number and the documents you require when you apply for a loan. A family member holding a job, needs to sign as surety for a study loan.

Institution Name	**Contact Number**	**I Have The Required Documentation To Apply**	
1		YES	NO
2		YES	NO
3		YES	NO

Applications

Have you applied for a bursary	YES	NO

8. Draw up an Action Plan

Complete the Action Plan below, use the following questions as a guide:

1. What is your career goal?
2. At which institution do you plan to study?
3. Do you meet the entry requirements ?
4. What level do you plan to complete, eg Diploma, Degree, Honours, Masters or PhD?
5. How are you going to finance your studies?

EXAMPLE of an Action Plan

Goal	*Action*	*Due Date*	*Completed*
I want to become a Geologist	*Check requirements for B.Sc. at UWC* *C in Maths* *B in Physical Science*	*Use June Matric marks*	✓
	Apply to UWC	*30 Sept.*	
	Study to B.Sc. Honours level		
	Bursary and Student Loan	*Applications to Study Trust (bursary) (30 Sept.)* *Anglo Platinum (15 May)* *Department of Mineral Resources (30 Oct.)*	

YOUR ACTION PLAN

Goal	**Action**	**Due Date**	**Completed**

This booklet is an initiative of the Science Promotion Unit, of the Department of Science and Innovation. For any further information or to request a copy, please contact:

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