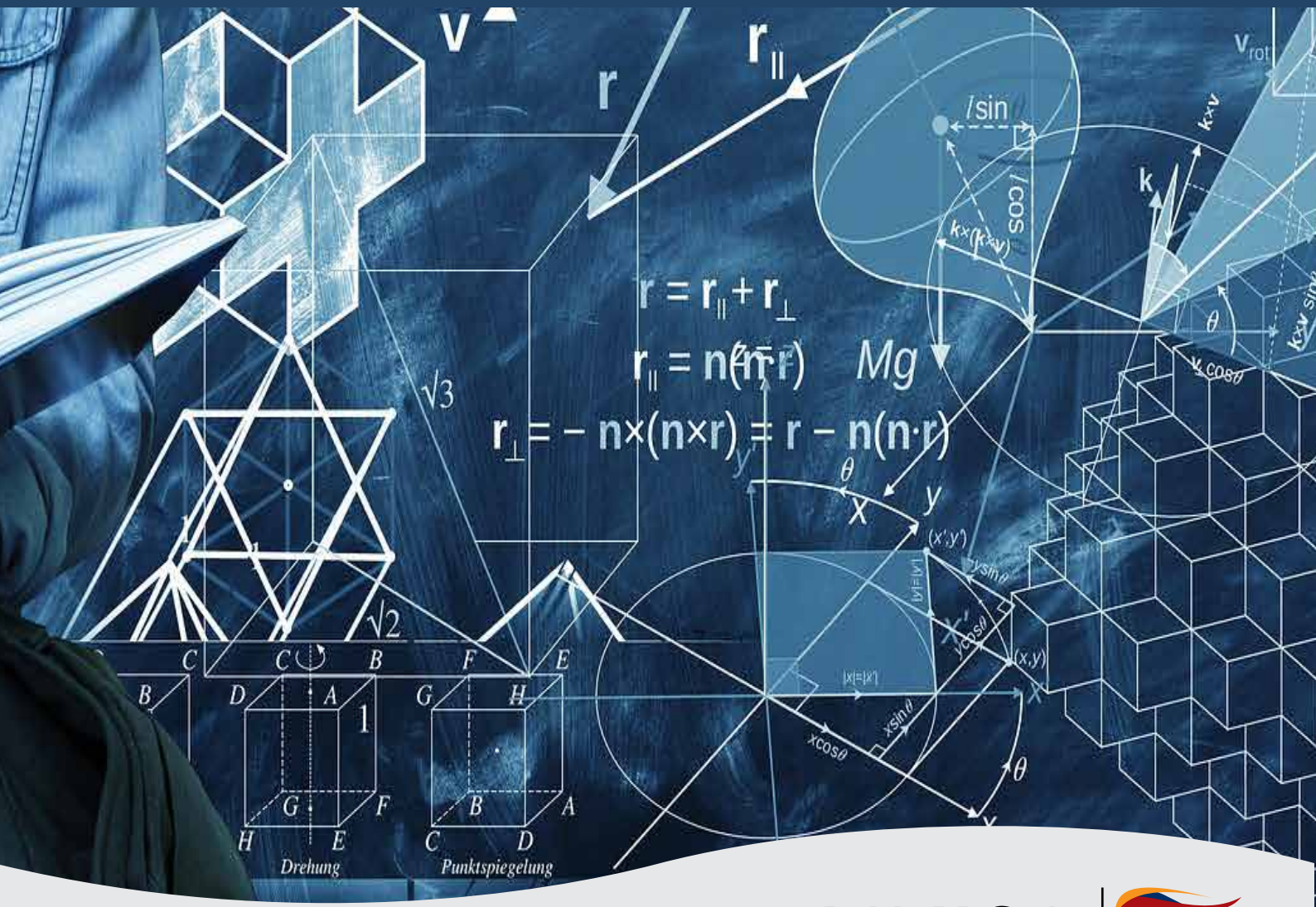
Physics @ Unisa

A complete guide to preparing yourself for career opportunities



Define tomorrow.

UNISA university of south africa

Contents

The information in this publication is correct as of 9 December 2019. Visit the Unisa Counselling and Career Development downloads page (http://bit.ly/30ygrIl) to check for updates.

Please check the Unisa qualifications webpage (http://www.unisa.ac.za/qualifications) regularly for updates related to available qualifications and the admission requirements to study.

How will this brochure help me?

- It will provide you with some insight into what studying physics involves.
- It will help you to explore the career opportunities and work environments linked to physics.
- It will help you gain more information about the sub-specialities in the field of physics.
- It will assist you with finding relevant qualifications offered by Unisa.

Before you start: Why this field?

Before considering pursuing this field of study there are some basic questions you can ask yourself:

- Why are you interested in studying physics?
- Where does your interest come from?
- Where are you hoping to be in five years' time? In ten years' time?
- What opportunities are you hoping to prepare for by completing a qualification in this field?

What is physics?

The dictionary defines physics as the branch of science concerned with the nature and properties of matter and energy. The subject matter of physics includes mechanics, heat, light and other radiation, sound, electricity, magnetism, and the structure of atoms. The physical properties and phenomena of something (https://en.oxforddictionaries.com/definition/physics).

Questions that fascinate physicists:

- What is matter made up of?
- How do reduce carbon footprint?
- What are alternative sources of light?
- Are there alternative sources of energy?

Experimental physics	Computational physics	Theoretical physics
• Create and test hypothesis Observe results and offer a conclusion • Goal: establish a scientific law that seeks to predict phenomena in the natural world • Keep abreast of current physical theories in the scientific world and seek to validate or challenge them	Using computers to solve physical problems for example via computer simulations	• Seeks to explain the results obtained using experimental physics through mathematical formulas • The results and conclusions are reached using a mathematical formula • Goal: offers a way to quantify and calculate and thus predict

		phenomena in the natural world • Seeks experimental data and new concepts and then seek and interpret experimental findings

Extracted from http://www.teach-nology.com/teachers/subject_matter/science/physics/

Learn more about what the subject entails at Unisa: https://www.unisa.ac.za/sites/corporate/default/Register-to-study-through-Unisa/Subjects-&-modules/All-subjects/PHYSICS.

What subjects can be combined with physics?

- Mathematical sciences: Applied Mathematics, mathematics, statistics, operations research
- Archaeology
- Life Sciences: Biochemistry, microbiology, physiology, zoology
- Computer Science or Information Systems
- Chemistry
- Psychology
- Geography (environmental management)

Skills needed for a career related to physics

- Scientific and technical knowledge
- IT and computer skills
- Communication skills
- Numerical skills
- Data collection and analysis
- Critical thinking
- Problem solving

Job opportunities and work environments related to physics

Possible job titles

- Physicist
- Scientist
- Research and Development Manager/Scientist
- Geophysicist/field seismologist
- Metallurgist

- Nanotechnologist
- Implementation consultant
- Technical or scientific writer
- Radiation protection practitioner
- Research scientist (physical sciences)
- Educator
- Academic staff member
- Algorithmic Trading Quant
- Radiation Protection Physicist
- Quality Assurance Officer
- Laboratory Technician or analyst
- Quantitative Data Analyst
- Applications engineer

Explore further:
http://www.saip.org.za/images/stories/documents/Outreach/Physics_Careers_Booklet_Final_Web_edition.pdf

https://www.uj.ac.za/faculties/science/physics/Documents/Science-SAASTA-Careers-in%20Physics.pdf

Possible work environments

- aerospace and defense
- education
- energy
- engineering
- instrumentation
- manufacturing
- oil and gas

- science and telecommunications.

https://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree/physics
http://www.physics.org/careers.asp?contentid=381

What do people in the field have to say?

Making a career decision and deciding on the subjects to major in might be overwhelming. You invest a lot of time, energy and finances into a degree and you want to make the best decision the first time around.

Activity

When you try to decide whether physics is the most suitable subject for you to study it is best to gather first-hand information from people who work in the field as this will assist you to formulate an objective point of view.

Read the articles linked to below and reflect on what you have learnt and how it affects your career decision.

10 Questions for a physicist: Christian Bauer; https://www.energy.gov/articles/10-questions-physicist-christian-bauer
I learnt the following from reading this article:
Physics to freelance: http://www.iop.org/careers/workinglife/articles/page_52067.html
I wish to explore the following about physics after I have read this article:

UCT professor wants to make SA centre of mathematical universe: http://www.corporateimage.co.za/uct-professor-wants-to-make-sa-centre-of-mathematical-universe/
Which specialisation in the field of physics would I be keen to explore:
Young SA nuclear physicist hopes to bring new mobile charging technology to SA; https://www.news24.com/Video/Sci-Tech/News/young-sa-nuclear-physicist-invents-mobile-charging-device-that-uses-wifi-20151118
What are some of the challenges that face South Africa that I would be interested to explore:

Identify opportunities with career research

How do you identify opportunities?

Labour market information can help you when you search for work, plan your career or explore self-employment opportunities. It is essential information to have if you

want to make informed career decisions and/or search for a job. It can tell you how industries and occupations are changing; what skills are needed; and the working conditions for specific jobs and industries.

There are many factors that influence the availability of jobs such as the impact of globalisation (local companies having to compete on the global market) and technology (use of computers and the availability of information electronically) on the international and national labour market. This means that you need to do continuous research as circumstances change constantly. Also, you will need to be creative in finding labour market information – all the information that you need is not stored in one place.

Your career research will connect you to others who will help you to:

- answer questions you have with relation to your career choice;
- expand your understanding of the opportunities related to your career vision;
- identify “hidden” career paths that you did not think of previously; and
- think about how you could plan to pursue specific opportunities.

Prepare

Think about what you still need to find out: what questions do you have? You will use these questions as a starting point to structure your research. Examples of questions include: “What can I do with a major in physics””, “How much do physics lecturers earn?” or “What must I study to be a physicist?”

Keep track of information

Keep track of your research by making notes about what you learn and what you still need to find out. Use online services or apps such as Evernote (http://www.evernote.com) or Diigo (http://www.diigo.com) to keep track of your research online.

Evaluate

Evaluate the information that you are finding: Who wrote the information (person/ organisation)? Which country does the information relate to? When was the information last updated? After you have visited several websites, you could compare your notes about the information you found – what are the similarities and differences? What else do you need to find out?

Further ways to do career research

1 Online search

Use a search engine such as Google to search for information related to your questions. For example, you need to find out about career opportunities related to physics. You could start with using keywords such as “careers in physics”, and then to further contextualise your findings, you could search keywords such as “careers in physics Africa” and “careers in physics South Africa”. Scan the brief descriptions of the first ten results and decide which website you would want to explore first. Skim read through the information on the website (start with the headings) to get an understanding of the content of the page and to find information related to your question. Also check whether there are links to other websites that you could further explore. As you are reading, make a summary of the information. You could use the information you find to make lists of job titles related to your field of study, organisations that employ individuals in these fields and professional organisations.

Remember to bookmark pages that you would want to return to and make notes about what you find and what you would still like to find out about.

Activity

Use Google to find specific job titles related to the field(s) of study you wish to explore. The following are some example search terms you could consider: “job titles physics”; and “job titles physics south africa”.

Job title	Website
Example: **Physicist**	Quintcareers.com

2 Occupational information websites

The following websites will help you to learn more about specific job titles:

Website	Description
Unisa Counselling & Career Development http://bit.ly/2TO2KoR	This website provides more information about opportunities related to qualifications at Unisa.
National Career Advice Portal (NCAP) http://ncap.careerhelp.org.za/occupations	Search for information about any of the specific job titles you identified during your Google search and in this brochure. The website also provides information about occupations that have been identified as in high demand, and green occupations.

Website	Description
Career Planet http://www.careerplanet.co.za/	Learn more about career areas such as IT, tourism, engineering and more. The website also contains information about learnerships and student finance
O*Net http://www.onetonline.org/	Explore job titles related to different categories such as your interests, skills, values, typical work activities, and more. You could also browse through groups of occupations related to specific industries or economic sectors.
Prospects http://www.prospects.ac.uk/	Explore different job titles related to job sectors, as well as what you could do with your major subject.

Activity

Go to any of the above occupational information websites and search for the job titles you identified during the Google search activity.

Use the tables below to explore your top three occupational interests.

Example table:

Job title	Website	Related job titles?	Pros	Cons
Physicist	NCAP			

Job title #1	Website	Related job titles?	Pros	Cons

Job title #2	Website	Related job titles?	Pros	Cons

Job title #3	Website	Related job titles?	Pros	Cons

3 Job-search portals

Job search portals are useful in terms of researching specific job titles linked to different career fields and industries. Finding job advertisements that interest you is a worthwhile activity, even if you are not currently applying for jobs. You may not yet be eligible to apply for your dream job, but you can still gain a lot of information that can be applied to your career planning. For example, you are interested in physics, but you are not sure which specific job titles are linked to this field; or you want to know what kind of qualifications and skills are needed to be a physicist at a hospital.

You can use this information to make career goals, and think strategically about how you can develop experiences that will help you meet more of the selection criteria in the future.

Job search sites include

- PNet (http://www.pnet.co.za)
- Careerjunction (http://www.careerjunction.co.za)
- Careers24 (http://www.careers24.com/)
- Indeed (http://www.indeed.co.za)
- Government positions (http://www.gov.za/aboutgovt/vacancies.htm)

Activity

- Use one of the websites above to search for jobs related to physics. Read at least three advertisements and note the information in the tables below.

Job title #1	
Salary	
Organisation	
Responsibilities/ duties/ tasks	
Requirements (qualifications)	
Requirements (experience)	
Requirements (skills)	

Job title #2	
Salary	
Organisation	
Responsibilities/ duties/ tasks	
Requirements (qualifications)	
Requirements (experience)	
Requirements (skills)	

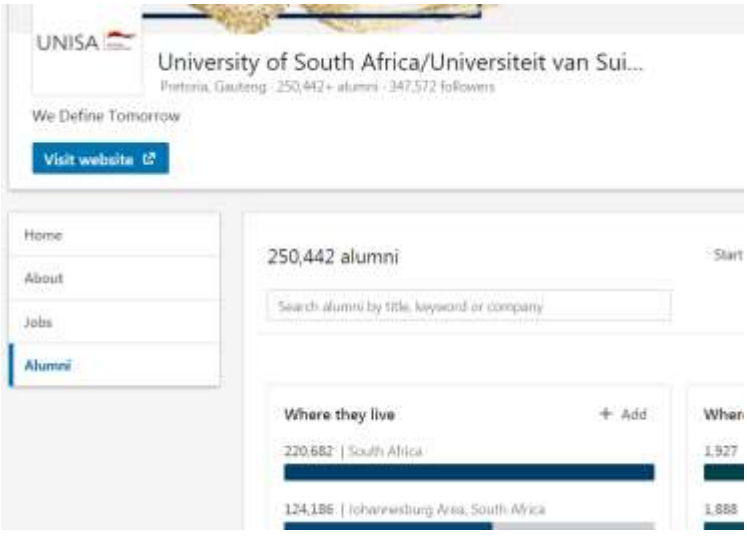
Job title #3	
Salary	
Organisation	
Responsibilities/ duties/ tasks	
Requirements (qualifications)	
Requirements (experience)	
Requirements (skills)	

4 LinkedIn

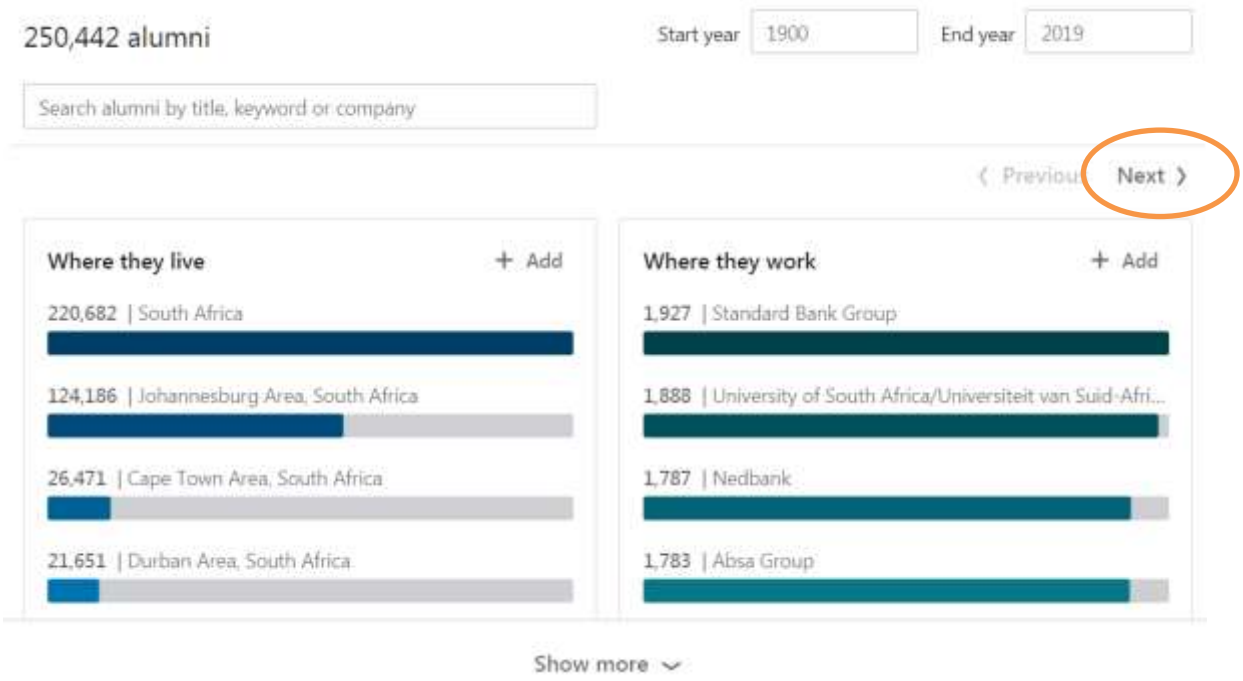
If you have not done so already, start building your network on LinkedIn (http://www.linkedin.com) today!

Register for a free account and start connecting with your network online. Join groups relevant to your career field so that you could participate in discussions, ask questions and provide answers about specific topics and search for people, organisations and jobs in your field of interest. Do research about companies and employees to help you identify opportunities. To learn more about using LinkedIn effectively, go to http://bit.ly/2JSxa3b.

1. Go to www.linkedin.com and sign in to your LinkedIn account. If you do not have an account yet, then create one.
2. Make sure that you have captured your current or previous studies at Unisa on your LinkedIn profile.
3. Once you are signed in, go to the University of South Africa page at https://www.linkedin.com/school/12049/.
4. Click on the “Alumni” link.



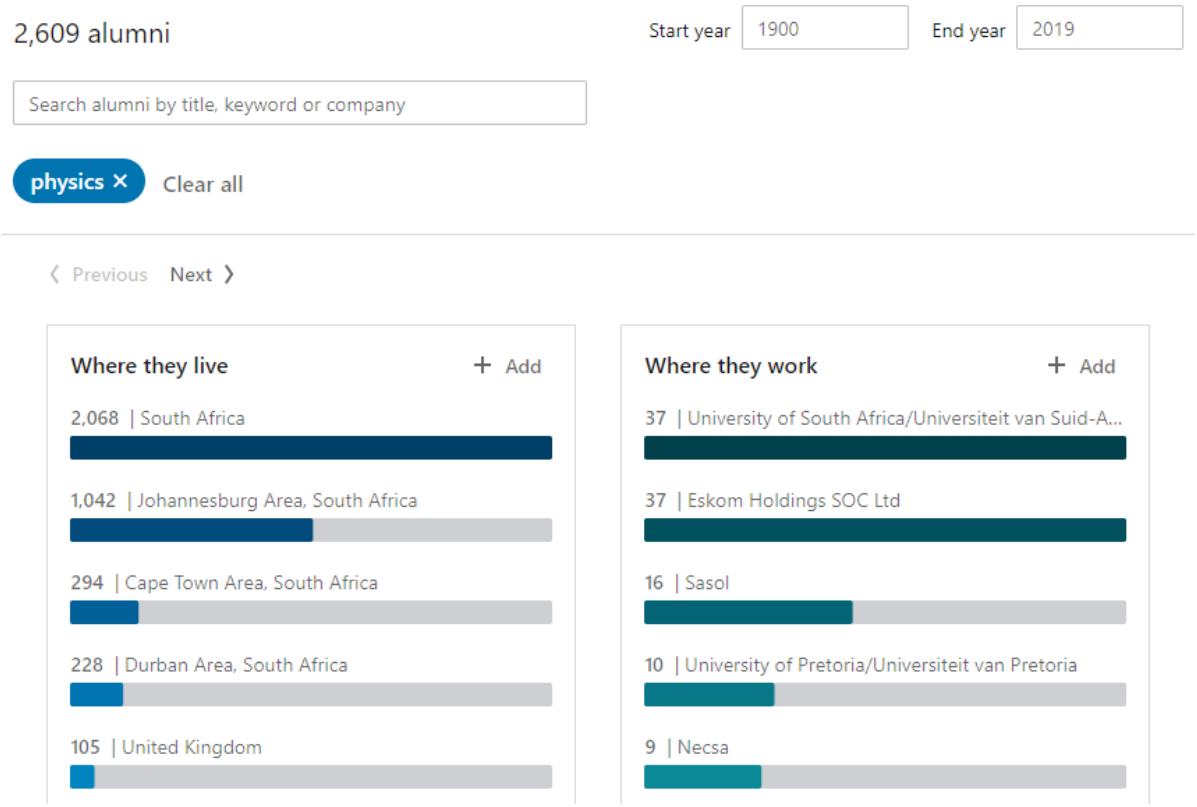
5. Click on the “Next >” link to go to the next set of headings (“What they do” and “What they studied”.



6. Click on “+Add” next to the heading “What they studied”

7. Type in “Physics” in the Search box.

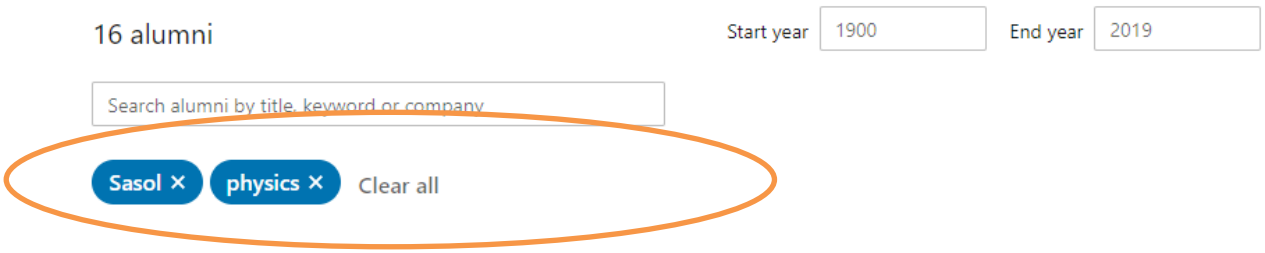
8. You will notice that the graphs for the different headings adjust. You have now filtered the information to contain information about Unisa graduates who studied physics.



9. You can now see how many graduates in physics are on LinkedIn, where they work, what they do, what they're skilled at, and how you are connected. For example, in December 2019, most alumni who studied physics worked at Unisa, Eskom, and Sasol.

10. You are also able to view the profiles of alumni who meet the criteria you searched for. For example, you can filter your search results to those alumni who indicated that they studied physics, and work at Necsa.

11. As you filter the results, you will get an indication of the filters you have selected (e.g. physics). You can clear these filters by clicking on the x next to the filter or clicking on "Clear all".



12. Make some notes about the interesting things you find below.

Your notes about what you find on LinkedIn

5 Talk to others (informational interviewing)

Once you have done some research about specific options, your next step is to talk to individuals in the type of job/ industry that you are interested in. The goal of these conversations is to explore your career options, to expand your network, to build confidence, to access information and to identify your own strengths and areas of development. For example, you read an article about how *A new quantum sensor can improve cancer treatment* and you feel curious about how the scientists went about exploring the topic. You could contact him or her to ask if they would be willing to share how they went about identifying an area of specialisation. Before you interview someone, do research about what you would want to discuss with them – you could ask this person to "fill in the gaps" for you. Start with people you already know: friends, family, neighbours, colleagues, lecturers, tutors and fellow students. Use online social networks such as LinkedIn to further identify potential people. For more information on how to go about this and suggestions for questions that you might want to ask, go to http://bit.ly/2LX7qp3. Also, watch this video to learn more: The Dos and Don'ts of Informational Interviews: http://youtu.be/ixbhtm8l0sI.

Remember to keep track of the information you have gathered and how you make sense of this. Also, track the questions you still have and how you think you would be able to get answers to these questions.

Activity

Write a list of any people you know who might work in the fields you are interested in. For instance, do any of your parents' friends work in any of the fields you are considering? And write a list of those people who could give you information about any careers you are considering.

You may have identified a lot more people than you thought! Imagine how much information you can gather about the career you are interested in just by talking to these people. Each person will give you fresh insights, opinions and valuable information about the careers you are considering, whether they are currently working in that field or are only remotely related to or associated with it.

6 Attend a careers fair event

Attending a careers fair event gives you the opportunity to speak to people from different industries. You may be studying a qualification that does not seem to have a direct link to the exhibitors or the presenters, but they have one thing in common: they employ people, who work in organisations, who do business with all kinds of suppliers and services. Somewhere in this value chain your qualification will find a place to fit – either as a customer or as an employer or employee.

The annual Unisa Careers Fair usually takes place from March to August at various venues. Go to http://www.unisa.ac.za/counselling for more information.

7 Experience studying topics related to your field of interest

Explore what physics is by watching and listening to on-line lectures and reading free open textbooks on a variety of topics related to physics. These resources will enhance your understanding of the various opportunities related to this field.

Search for physics related courses and open textbooks on these sites:

- Coursera.org (http://www.coursera.org/)

- Udemy (http://www.udemy.com/)
- Saylor Academy (http://www.saylor.org/books/)
- Khan Academy (http://www.khanacademy.org)
- Open University (http://www.open.edu/openlearn/free-courses)
- MITOpenCourseware (http://ocw.mit.edu/index.htm)
- iTunes university (http://www.apple.com/education/itunes-u/)
- OpenLearn (https://www.open.edu/openlearn/free-courses)
- YouTube (http://www.youtube.com)
- FreeVideoLectures (http://freevideolectures.com/)

8 Join a professional organisation

Professional organisations can be a very effective way of finding information related to your field of study and many offer networking opportunities such as meetings, training, and conferences to help professionals in a particular field connect to each other. The following professional organisations are related to physics:

- South African Institute of Physics (http://www.saip.org.za/)
- Final year Natural Science students can register with the South African Council for Natural Science Professions (http://www.sacnasp.org.za/)

Prepare for opportunities and plan your career

> “Don’t ask kids what they want to be when they grow up but what problems do they want to solve. This changes the conversation from who do I want to work for, to what do I need to learn to be able to do that.”
>
> *Jaime Casap, Google Global Education Evangelist*

One interesting way of preparing for opportunities and planning your career is to think about the type of problems you would want to be able to solve. This will help you to focus on what you wish to contribute, and not necessarily, who you want to “become”. Once you have identified some of the problems you would want to focus on, you can then explore how individuals from different academic and professional backgrounds are addressing these problems. Then, you could start thinking about how you would want to contribute and what you will need to do in order to prepare for this.

Activity

Think about your environment (family, community, South Africa, Africa, international) and what problems or challenges you know about. Perhaps you have even thought of possible solutions to these challenges. Write down some of the problems or challenges you would want to address.

Problems/ Challenges

Next, think about how you would want to contribute to addressing some of these problems/ challenges. What would your role be? Also, think about how you would need to start preparing for the roles you identified (think about education, work/ volunteer experience).

Problems/ Challenges	My role	How do I need to prepare

The following are some ideas of challenges/ problems experienced across the world, including South Africa.

Access to digital technologies

Access to education

Access to employment

Access to health care

Affordable energy

Ageing world population

Cancer

Child labour

Clean air

Clean water

Climate

Climate change

Corruption

Crime

Data security

Digital economy

Disabilities

Disaster management

Discrimination

Economic growth

Economic inequality

Economic inequality

Ethical institutions

Food security

Gender inequality

Health and well-being

HIV/AIDS

Human rights

Hunger

Illegal drugs

Income inequality

Justice

Knowledge transfer

Lifelong learning

Literacy

Nutrition

Peace

Poverty

Quality education

Rapid urbanisation

Retirement

Rural development

Safety at work

Sea life

Skills development

Skills gap

Small enterprises

Social cohesion

Social inequality

Substance addiction

Sustainable agriculture

Sustainable communities

Sustainable economic development

Unemployment

Urban development

Violence

Water security

As an example, you may want to address the problem of pollution. Think about the different individuals that may be able to contribute to the solving of this problem: a mechanical engineer may develop a car that uses alternative fuels; an architect would develop buildings that uses less energy for heating and cooling; and a materials scientist would investigate how solar panels can be more efficient. As a physicist, your contribution would be to conduct research related to developing clean energy sources and therefore reducing pollution.

Prepare for career opportunities

Many people believe that a degree will lead directly to a career specifically related to the major(s)/ specialisations for that degree. The fact is that degrees do lead to careers, but that the relationship between the major(s)/ specialisation you choose and the career you build for yourself is complex. Many graduates follow careers that are seemingly not related to their chosen major(s)/ specialisations. Various career management techniques will assist you in managing your career in physics:

1. Develop and reflect on your transferable skills
2. Start with a career portfolio
3. Volunteer work
4. Enhance your employability

Develop your skills

Develop and reflect on your transferable skills

Your degree will equip you with subject-specific knowledge and several work-related skills (transferable skills), for example, the ability to learn fast in new situations, to work independently, and to analyse, evaluate and interpret data. You should be able to identify and articulate the skills that you feel you are gaining through your studies. While you are busy with your studies, you need to reflect continuously on how you could apply the skills that you are learning to contribute to your professional development and who will be able to benefit from what you already know.

Skills reflection

Module passed in the last semester	Skills developed	How can I use the skills to add value to an organisation, or help them solve specific problems?

Start with a career portfolio

Your career management portfolio could help you keep track of the information that you need to gather to manage your career. It could include information about yourself, about job opportunities, occupational information and about the different fields related to physics. Learn more about compiling a career portfolio here: http://bit.ly/2WaPes7.

Work experience for physics students

Gaining experience is an important part of helping you develop transferable skills as well as specific career-related skills.

Volunteer work

As a volunteer, your studies will be enriched, and you will be able to build up an important network of people who could comment on your professional abilities. You may be wondering how volunteering is related to your studies and your career. We would encourage responsible volunteering where the organisation and community that you are supporting benefit. You also can apply and further develop your skills and knowledge as a student to support

the community. Your volunteer work links to your career vision and planning: before you volunteer, think about where you would want to invest your effort.

Volunteering will help you to:

- figure out whether a specific field of work is for you or not;
- find out information about a specific field;
- connect with others and maintaining relationships;
- network with others in your field of interest.

Some questions to think about:

- Which organisations or community would benefit from my skills and knowledge?
- How would this organisation or community contribute to my career vision?
- What conduct is expected of a professional in this organisation and in my future career?
- What are you hoping to gain from your volunteer activities?

Your volunteer work could lead to other opportunities, so it is important to treat it professionally: keep to your commitment, communicate when you cannot volunteer and update your portfolio with examples of what you have learnt and achieved. As a volunteer, you are already working as a professional – you need to conduct yourself as you would conduct yourself in a work environment. As you are volunteering, you are building your reputation (your “brand”): you would not want to build a reputation as an exploiter or as an unreliable worker.

Your volunteer environment will help you to develop what is valued in professional environments. This includes punctuality, problem-solving and effective communication. In this sense, volunteering contributes to your development as a unique graduate: one who has subject-specific knowledge and an understanding of professional workplace behaviour. The one thing to remember about volunteering is that your conduct needs to be accountable and ethical. Consider that you are contributing to the community and at the same time you are building your skill sets for the

workplace – you need to balance self-interest with that which may benefit others. It is important that your work within the community be done with the utmost respect.

Identify volunteer opportunities in your area through conversations with members of your community. The GreaterGoodSA website at http://www.greatergoodsa.co.za/ will further help you to identify volunteer opportunities in your community that are related to your interests. Make a list of the organisations that you would want to contact about exploring volunteer opportunities.

Activity

Identify a volunteer work opportunity.

Make a list of the organisations that you would want to contact about exploring volunteer opportunities.
What are you hoping to gain from your volunteer experience?
What can you contribute to an organisation?

Enhance your employability

Your employability refers to your ability to gain initial employment, maintain employment, and obtain new employment if required. In simple terms, employability is about being capable of getting and keeping fulfilling work. There are many aspects related to maximising your employability, including managing your personal brand, job-searching skills, networking, writing a CV, writing a cover letter, include networking, CV-writing, cover letter writing and how to manage job interviews.

Why is your employability important?

Today's careers are not what they used to be: Lifetime employment is a thing of the past: It is not unusual for an individual to hold about six different occupations during their careers, each with several jobs. The reasons for this are technological advances, globalisation, economic shifts and changing social norms. Careers are boundaryless: your career can cut across different industries and companies. Instead of seeing your career as a ladder, you can view it as a web. Career success is defined in many ways: The big house and fancy car are not the only measures of success. Some people choose to follow a more balanced lifestyle with more time to spend with their family. Where, when and for whom you work are not necessarily fixed: Flexible work hours, working from home, part-time, temporary and contract work is all part of today's world of work.

Source: Greenberg, J. & Baron, A. Behaviour in Organisations. 8th edition. Pearson Education Inc: New Jersey.

How can you develop your employability skills?

- Work through the information and activities on the *Prepare for job opportunities* section of the Directorate: Counselling and Career Development website (http://bit.ly/2ufeSA6).
- *The Muse* career website (https://www.themuse.com/advice) provides career advice related to your career questions.
- LiveCareer has an extensive library of resources related to enhancing your employability. Go to https://www.livecareer.com/ for more information.
- The Monster website (http://www.monster.co.uk/) provides several articles related to employability issues. Click on “Career Resources” and “Browse Career Advice” (at top of page) to access career-related information.

Self-confidence

Your personal experiences (for example, your relationships with your parents and siblings; how you related to peers and how you compare yourself to others) shapes your self-confidence. Low self-confidence on all areas of your life, mainly how you negotiate relationships, your career and your studies.

How much you believe in yourself or you do not believe in yourself impact on your success in your career and studies. Low self-confidence affects your career and your studies in several ways:

- Your confidence determines the effort and determination towards your studies and your career. For example, if you do not believe that you can pass a particular module, you also do not spend time studying, since when you start studying you feel like “what is the use – I will fail in any case”.
- If you keep on telling yourself that, you are not capable of completing your qualification because you have low self-confidence, challenges in your

studies act as confirmation that you are a failure. You will then also not go out and get help since you do not think that it will make a difference – you are not hopeful that this could change how you perform.

- Even when you experience challenges that are normal for all students to experience, you tell yourself it is a confirmation that you cannot make it.
- You spend disproportional amounts of time and energy gathering evidence or reinforcing your belief that you cannot make it so that it becomes a reality.
- When you do things well or when you get positive results you deny them. You find it hard to accept that positive things can happen in your life and you find external factors that have contributed to the results or success.
- You will make statements such as “Maybe I was just lucky this time – the other candidates did not accept the offer due to a low salary offer” or “Maybe the lecturer felt sorry for me.”
- When you are presented with an opportunity, you will not use it since you are concerned about failing.
- You project a negative attitude towards yourself and others. You find it hard to appreciate the strengths of others and you are critical about others.
- You will not take a risk to advance in your career because you think you will not make it. For example, you will not apply for an internship because you decide that you will not be selected even though you meet all the requirements.
- You are always concerned about how other people think about you in a negative way- you will not go and talk to the lecturer or ask other people because you think they will think you are stupid.

On the other hand, when you have a healthy self-image:

- You accept yourself for who you are and you acknowledge that there are things you do well and things you do not do well.
- You use your strengths in one area to build your self-confidence in other areas.
- You acknowledge things people appreciate about you since you use these as a re-affirmation to develop areas where you feel you have room for growth.
- You believe you can achieve your desired career goals and you put your energy and resources towards your vision. This affects your studies in that you can talk to others about your study-related challenges and you are pro-active in terms of managing your studies since you know why you are studying.
- You can recognise and make use of presenting opportunities since you believe that you can contribute.
- You can help others understand your potential and you appreciate how others could contribute to your development.
- You are more able to deal effectively with feedback on your performance since you are able to integrate the feedback with your self-knowledge.

How do I build a healthy self-confidence?

Building self-confidence is a process – it is like building a house: Building your confidence starts with small, practical actions. As you get feedback about your actions, you take some positive things out of it about yourself and appreciate the things you can do well and those you have to develop.

Spend some time each day writing down things you did yesterday that you can be proud of and things you would want to do differently.

Give yourself time to develop – a house cannot be built in a day.

Most importantly, it must not be about thinking about things, but about doing things. This will not always be easy, but you need to take risk and test what you can do and also see the results of

your actions. For example, if you really want information about your career, take a risk and send an e-mail to your lecturer with questions to see what the response is. As you take the risk, you need to change your attitude about how you view challenges and yourself. You will start thinking differently about challenges: that they are not meant to prove you as a failure, but rather to learn and discover new things about yourself.

You need to be able to embrace failure as part of the process in order to succeed. Your failures do not define you as a person: Even when you fail, you do not internalise the experience that you are a failure. You learn from the experience and you try again.

We want you to keep in mind your three circles (career, studies, and personal life) and make sure that you use one of the circles where you have more positive experiences to influence the other areas. For example, in your studies, you are getting good results and you are capable. However, you feel demotivated every time you think about your family situation.

Think about how the fact that you are succeeding with your studies could affect your career. Could it make you hopeful that you will be able to find a good job and then change your family's situation in the future? Thinking more about the things you can control (for example, your studies and how this will impact positively on your career), enables you to minimise the sense of helplessness in terms of your family situation. When you focus on the things you can control, you create a positive outlook on yourself, your life and others.

My career learning plan

Your career learning plan will help you to stay focused on what you still need to do to find out more about your career development. The career learning plan focuses on the following questions: What is the information you still need? How will you get this information and by when?

Further information needed	Steps to get this information	When?
Where do physicists work in SA?	Start with Google search	14 April
	Talk to lecturer about referring me to someone who works in this field	15 April

Qualifications offered by Unisa

Visit the Unisa website at http://www.unisa.ac.za/qualifications for more information about these qualifications.

Undergraduate Qualifications

College of Science, Engineering and Technology

- Bachelor of Science Applied Mathematics and Physics Stream (98801 - AMP)

- Bachelor of Science Chemistry and Physics Stream (98801 - CAP)
- Bachelor of Science General (98801 - GEN)
- Bachelor of Science Mathematics and Physics Stream (98801 - MAP)
- Bachelor of Science Statistics and Physics Stream (98801 - STP)
- Higher Certificate in Physical Sciences (90101)

One of the admission requirements for the above degrees is that you need to have offered Mathematics and Physical Science as subjects on Grade 12 level. If you took these subjects but your percentage was below the requirement for the BSc degree, then you will need to explore the option of applying for a Higher Certificate in the College of Science, Engineering and Technology. Completing a relevant Higher Certificate programme will enable you to meet the requirements for a degree. Visit the Unisa website at http://www.unisa.ac.za/qualifications for more information about the admission requirements for these degrees.

College of Economic and Management Sciences:

- Bachelor of Business Administration Business Administration (98316 - BBA)

It is important to note that if you do not meet admission requirements for the undergraduate qualification in the College of Economic and Management Sciences then you will need to explore the option of applying for a Higher Certificate offered in the College of Economic and Management Sciences. Completing a relevant Higher Certificate programme will enable you to meet the requirements for a diploma or degree.

Postgraduate Qualifications

Honours degrees

- Bachelor of Science Honours in Physics (98918)

Master's and Doctoral degrees

- Master of Science in Physics (Full Dissertation) (98980)
- Master of Science in Physics Education (Full Dissertation) (98967)
- Master of Science in Science Education (Full Dissertation) (98968)
- Doctor of Philosophy in Physics (98981)

Frequently asked questions

I did not complete mathematics and/or physical science at matric level – can I study physics at Unisa?

For the Colleges of Science, Engineering and Technology and Agriculture – no. The admission requirements stipulate that mathematics is one of the admission requirements. If you did not complete mathematics in matric you cannot gain access to any of the BSc degrees. Note the current (2019) admission requirements on the Unisa website at https://www.unisa.ac.za/sites/corporate/default/Apply-for-admission/Undergraduate-qualifications/Qualifications/All-qualifications/Bachelor-of-Science-General-(98801-%E2%80%93-GEN)

I completed mathematics and physical science at matric level, but my marks were below 50% - what can I do?

You will need to consider applying for admission to a Higher Certificate offered in the College of Science, Engineering and Technology. Visit the Unisa website at http://www.unisa.ac.za/qualifications for more information about the available Higher Certificates and their requirements. Completion of a Higher Certificate does not guarantee you admission to a further qualification since the University also considers the number of available spaces for a specific qualification. Read more about the role of the higher certificate qualifications here: http://bit.ly/2lLN5Gw.

Is there a practical component to the course and do I need to complete these to graduate with a qualification in physics at Unisa?

Yes. The degrees related to physics contain practical modules on each level of study. Arrangements are made for students to complete the required laboratory work at the Unisa campus in Pretoria, or at an official location elsewhere.

What if I start with one qualification and wish to change to a different qualification that includes physics as a major subject?

You can apply for admission to a new qualification. Note that you must ensure that you meet the relevant admission requirements for the proposed qualification. Once the application is approved you can register in the next registration period and apply for the transfer of relevant credits, if applicable.

I want to become a physical science teacher. What do I study at Unisa?

You must complete a Bachelor of Education in Senior Phase and Further Education and Training Teaching School subject combination: Physical Science and Mathematics.

Counselling and career development services at Unisa

The Unisa Directorate for Counselling and Career Development offers career-, academic- and personal counselling services to Unisa students and the broader community. You can talk to a counsellor about:

- **Career decisions.** I am not sure which career path to follow; I don't know which qualification would be best; I want to change my career direction…
- **Career information.** How can I find out more about a career in …
- **Employability.** How do I market myself to employers? How can I look for work? How can I compile an effective CV? How do I go about networking with others? How do I put together my career portfolio? How can I meet potential employers? How can I improve my interview skills?)
- **My studies at Unisa.** How can I get started with my studies? How do I plan my studies? How can I study more effectively? I don 't feel motivated to continue with my studies… I feel worried about preparing for/ writing the exams. I failed my exams – what now? I need to improve my reading/ writing/ numeracy skills
- **Personal issues.** How can I have better relationships with others? How can I cope more effectively with issues that impact on my studies?

Visit our website at http://www.unisa.ac.za/counselling to access many self-help resources, or talk to a counsellor by e-mail to counselling@unisa.ac.za.