

South African Council for Natural Scientific Professions



SACNASP

INFORMATION BROCHURE

and

REGISTRATION REQUIREMENTS

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How to apply

Please allow at least to two months for your application to be processed.

1. A person must apply to the Council, in the prescribed manner for registration in a category referred to in section 18(1) and a field of practice listed in Schedule I of the Act.

1.1 **Categories of registration**

- (a) professional natural scientist;
- (b) candidate natural scientist; and
- (c) certificated natural scientist.

1.2 **Fields of practice – Schedule I of the Act**

Agricultural Science	Forestry Science	Metallurgical Science
Animal Science	GIS Science	Microbiological Science
Biological Science	Geographical Science	Natural Science Education Science
Botanical Science	Geological Science	Physical Science
Chemical Science	Hydrological Science	Radiation Science
Earth Science	Industrial Science	Soil Science
Ecological Science	Marine Science	Water Care Science
Environmental Science*	Materials Science	Zoological Science
Food Science	Mathematical Science	
Forensic Science*	Mathematics Education Science	

* **Please refer to the special requirements on pp. 5 - 7.**

2. **Filling in the application form**

- 2.1 Consult the information brochure to determine which requirements are applicable for the category and field of practice for which is applied.
- 2.2 Please answer **all** the questions in the application form and ensure that you have **signed and dated** it.
- 2.3 Please PRINT and use **BLACK** ink. When filled in electronically, the applicant's details must be typed in **bold**.
- 2.4 **Applications dated back longer than three months when received, will not be accepted.**
- 2.5 **Incomplete applications cannot be processed. Please ensure that all the required documents and information listed below, are included.**
- 2.6 Do not fax your application documents or bind it in a file.

3. Documents and information essential to the evaluation of an application:

3.1 **Qualifications - please attach:**

(SACNASP reserves the right to check all qualifications at institutional level. Also see qualifications not acceptable for registration purposes - p. 7)

- (a) Certified copies of ALL degree/diploma certificates in the natural sciences.
- (b) Copies of qualification certificates should bear the **original stamp and signature** of a Commissioner of Oaths. Copies of copies are not acceptable.
- (c) Academic transcripts/records for: B.Sc. and B.Sc. Honours degrees; B.Sc. Agric., B.Sc. Agric. Honours degrees; N.Dip.; N.H.Dip., and B.Tech. degree.
- (d) If the academic records do not state clearly that at least two level-I basic natural science subjects were included in the curriculum, copies of the syllabi must be provided to enable the Council to verify the basic natural science content of the qualifications.
- (e) Proof of bridging courses studied and passed to supplement natural science content of undergraduate studies, if applicable.
- (f) Academic record or other official proof of course work for Master's degree, if applicable.
- (g) Abstracts (dissertations/theses): B.Sc. Honours/B.Tech.; M.Sc. or M.Tech., and Ph.D. degrees.
- (h) Proof of short courses passed, or other relevant informal training, in the field of practice Environmental Science.
- (i) **Foreign qualifications:**
The evaluation certificate issued by the Human Science Research Council (HSRC) or the South African Qualification Authority (SAQA) is not acceptable to the Council for registration purposes. The SACNASP Council's Education Committee evaluates all qualifications, issued locally or in foreign countries. The following information is required by the Education Committee to be able to make an assessment:
 - (i) certified copies of all relevant degree certificates;
 - (ii) the academic transcripts of the degrees;
 - (iii) proof of A-level subjects; or
 - (iv) any other information about the subject content (syllabi) that can assist the Council with the evaluation of the your application;
 - (v) abstracts from B.Sc. Honours, M.Sc./M.Phil. and Ph.D. degrees; and
 - (vi) English translations of degree certificates, academic records and abstracts issued in any foreign language such as Spanish, German, French, etc.

- 3.2 **Vocational Experience - please provide the following information:**
- (a) Full details of vocational experience **and** responsibilities of at least the last five years of the professional career (NOT A FULL CV), including a description of the current occupation, as well as a list of publications. **(Also refer to pp. 11 – 12)**
 - (b) NOTE: For registration purposes the vocational experience should be gained **after** the minimum qualifications required for the category for which is applied, were obtained. Applicants who were **employed on a full-time basis** and obtained a M.Sc., Ph.D., M.Tech or D.Tech. degree while **studying part-time**, vocational experience gained during this period, shall be taken into consideration.
 - (c) Experience in the natural sciences must be summarised in chronological order. Please give details such as name of company, position occupied and for which period(s). It must provide a clear *resumé* of experience in the natural sciences with special reference to the following aspects:
 - (i) Work done which required the application of the basic principles, methods and techniques of the natural sciences.
 - (ii) Description of any major research or other project or design, and their appropriate values, together with information regarding publications in recognised scientific journals.
 - (iii) Qualifications, type and number of personnel supervised.
4. **Referees**
- 4.1 References from professionals familiar with an applicant's work and professional conduct are immensely valuable in determining whether the applicant fulfils the experience requirements.
 - 4.1 Referees' reports are confidential and will only be used by the Council for the evaluation of an application.
 - 4.3 It is expected of referees to have personal knowledge of an applicant's character as well as of his/her experience in the natural sciences.
 - 4.4 At least one of the referees should be registered with SACNASP. In some cases registration with ECSA could be appropriate too.
 - 4.5 Do not use a subordinate in your company as referee, even if it is the only registered person known to you.
 - 4.6 Do not use a person registered as a Candidate Natural Scientist or Certificated Natural Scientist.
 - 4.7 Referee report forms will be sent to each of the referees by the Council.
 - 4.8 Names and particulars of two referees who can attest to an applicants' abilities must be provided (see application form.) Referees may be chosen in the following order of preference:
 - (a) Head of organization;
 - (b) Immediate supervisor;
 - (c) Professor or Head of Department;
 - (d) Mentor;
 - (e) Clients.
5. **Registration fees**
- 5.1 The registration fee covers the administration involved in processing the application and is **not refundable**. A fee is payable for **each field of practice** for which is applied and must be included with your application.
 - 5.2 **1 April 2006 until 31 March 2007:**
Professional Natural Scientist: R580.00 per field of practice.
Candidate Natural Scientist: R320.00 per field of practice.
Certificated Natural Scientist: R380.00 per field of practice.
 - 5.3 **Method of payment of fees:** By cheque, Internet or over the counter deposit.
Please fax proof of payment, together with first page of your application form, to 012 841 1057.
NB: Use initials and surname for identification of your payment on our bank statement.
 - 5.4 Banking details:
Beneficiary: SA COUNCIL FOR NATURAL SCIENTIFIC PROFESSIONS or SACNASP
 Bank: NEDBANK, Silverton
 Branch code: 164445:
 Account No: 1644292289 (current)
 SWIFT CODE: NEDSZAJJ
 - 5.5 If a person's registration had been cancelled due to failure to pay the prescribed annual fee or portion thereof, [section 21(1)(a)(iii)] of the Act, the **fees in arrears, as well as a re-registration fee**, will be payable. [Section 23(3)(b).]
6. **Annual fees and accounts**
- 6.1 A single annual fee is payable, regardless of the number of fields of practice for which the registered person registered.
 - 6.2 Annual fees will become payable on the 1st of April of the year **following the year of registration**, provided that, if a person is **registered during the first three months** of a year, the annual fee will become payable on the first of April of the same year.
 - 6.3 Once registered, the registration must be maintained by paying the prescribed annual fee, which becomes payable on the 1st of April each year.
 - 6.4 Registration will lapse if the annual fee is not paid within 60 days after it has become payable.
 - 6.5 It is the responsibility of the registered person to ensure that the fees are paid on time.

7. **Authorised titles**
- 7.1 Only a registered person may use the title and affix the prescribed abbreviation after his or her name.
- (a) Professional Natural Scientist – “Pr.Sci.Nat.”
 - (b) Candidate Natural Scientist - “Cand.Sci.Nat.”
 - (c) Certificated Natural Scientist – “Cert.Sci.Nat.”
8. **Certificate and registration card**
- 8.1 The certificate issued by the SACNASP **remains the property of the Council** and must be returned after cancellation of registration. (Section 24 of Act 27 of 2003.)
- 8.2 A registration card that expires annually on the 31st of May, will be issued to Professional Natural Scientists.
9. **Upgrading of status: Cand.Sci.Nat. to Pr.Sci.Nat.**
- 9.1 **An application for upgrading of status must be submitted in the prescribed manner, together with the prescribed registration fee.** A registration fee is payable for each of the fields of practice for which registration is required.
- 9.2 **Qualifications and official documents:**
Copies of qualifications and academic records are not required - **only certified** copies of qualifications obtained **after registration** as a Candidate Natural Scientist.
- 9.3 **Vocational Experience:**
- (a) Full details of vocational experience **and** responsibilities relevant to the field of practice for which is applied. (NOT A FULL CV.)
 - (b) A current job description.
 - (c) A list of publications. **(Please see 3.2 above. Also refer to pp. 11 – 12.)**
- 9.4 **Mentor’s report:**
- (a) A report by the mentor must be included with the application documents. This report should state clearly that the applicant has followed a training programme, and what his or her progress was.
 - (b) **Without such a report the Council cannot evaluate an application.**
- 9.5 **Referees** (See 4 above.)
- 9.6 **Annual fees:**
- (a) To maintain the registration, an annual fee is payable on the 1st of April of the year following the year in which the change of status took place, provided that, if a person’s status is upgraded during the first three months of a year, the annual fee becomes payable on the first of April of the same year.
 - (b) A single annual fee is payable, regardless of the number of fields of practice for which a person is registered.
- 9.7 **Certificate:** The certificate issued by the SACNASP **remains the property of the Council and must be returned** after the registration in any of the categories of registration has been terminated. (Section 24 of Act 27 of 2003.)
10. **Re-registration**
- 10.1 **An application for re-registration must be submitted in the prescribed manner together with the prescribed fees.** A registration fee is payable for each of the fields of practice for which re-registration is required.
- 10.2 If a person’s registration had lapsed more than three years ago, the complete file would have been destroyed, and a new application must be submitted. The application will be dealt with in the same manner as a new application, and a new registration number will be allocated.
- 10.3 If a person’s previous application documents were not destroyed, he or she will have to
- (a) apply by submitting the prescribed application form;
 - (b) submit academic records, abstracts of theses or dissertations and certified copies of all relevant qualifications that were not submitted previously;
 - (c) supply the Council with an updated record of relevant work experience.
- 10.4 Such a person as described in (10.3) above, will retain his or her registration number.
- 10.5 **Registration fee and annual fees in arrears:**
If a person’s registration had been cancelled due to failure to pay the prescribed annual fee or portion thereof, [section 21(1)(a)(iii) of the Act], the **fees in arrears, as well as a re-registration fee**, will be payable. [Section 23(3)(b).]
- 10.6 **Annual fees:**
- (a) To maintain the registration, an annual fee is payable on the 1st of April of the year following the year in which a person’s registration was reinstated, provided that, if a person is re-registered during the first three months of a year, the annual fee becomes payable on the first of April of the same year.
 - (b) A single annual fee is payable, regardless of the number of fields of practice for which a person is registered.

Special requirements

Recognition of Prior Learning and Experience

1. SACNASP acknowledges the fact that, for various reasons, certain individuals did not have the opportunity to obtain the level of tertiary education required by the Council for professional registration.
2. Such individuals, however, may have contributed immensely to the scientific community over many years and may continue to do so for many years.
3. The Council has decided to, **under certain conditions**, provide such persons with an opportunity to apply for registration as Professional Natural Scientists. **Any person, however, who does not hold a qualification recognised by the Council, may apply.**
4. **Requirements:**
 - 4.1 The applicant should be **nationally renowned** for his or her expertise in the field of practice for which he or she applies.
 - 4.2 Should have **contributed** to the scientific community,
 - 4.3 Should have a **minimum of 10 to 15 years continuous vocational experience, immediately prior to application**, in the field of practice for which is applied.
 - 4.4 If the applicant, however, **has left his or her profession** during that period, he or she would not be allowed to register under this dispensation.
5. **Information:**
 - 5.1 A formal application form with the applicant's signature and date, as well as the following information should be submitted:
 - 5.2 A portfolio on learning and experience:
 - (a) Proof of formal and informal training - certified copies of degree or diploma certificates, including the academic records for these qualifications.
 - (b) An extensive record of vocational experience in the field of practice as applied.
 - (c) A list of publications.
 - (d) Proof of membership of learned societies.
 - 5.3 Sworn affidavits by two referees who can attest to the applicant's abilities and expertise in his or her field of practice.
 - 5.4 At least three complete reports which have been compiled or substantially contributed to, or if not submitted due to confidentiality, the contribution must be verifiable; and
 - 5.5 A sworn affidavit stating that it is his/her own work and/or clarifying his/her role in the reports submitted.
6. **Evaluation:**
 - 6.1 A personal interview with the applicant by a panel of at least two people appointed by the relevant SACNASP Professional Advisory Committee (PAC). **A report by the interviewer(s) must be submitted to Council.**
 - 6.2 Evaluation of the applications by the relevant PAC, approval by the Registration Committee of SACNASP and ratification by the full Council.
 - 6.3 **The outcome of the evaluation shall not be made known until after the Council meeting.**

Environmental Science

1. The great variety of qualifications in the field of environmental science, offered by universities in particular, makes it at times almost impossible to evaluate a single qualification in this multi-disciplinary science. **It is therefore necessary to first establish whether a person would qualify as a scientist in one of the "generic" fields of practice.**
2. This implies that a person would have to be trained as a chemist, geologist, botanist or any of the other natural science fields and meet all the qualifications requirements before being eligible for registration in the field of Environmental Science. This does not imply dual registration.
3. In order to qualify, the following requirements must be met:
 - 3.1 Any person who wishes to be registered as a Professional Natural Scientist in the field of practice Environmental Science should have a four-year B.Sc, B.Sc. Honours or B.Tech. degree in the natural sciences.
 - 3.2 Such qualification shall include **at least one** subject, **other than environmental science**, from the fields of practice listed in Schedule I to the Act; must be studied in increasing depth and breadth over four years; and must be based on **at least two** of the appropriate level-I basic natural science subjects of physics, chemistry, mathematics and/or biology.
 - 3.3 **At least 50 % of the subjects in the programme must be classified as natural science subjects. (Also see requirements on pp. 8 – 10.)**
 4. **In addition to the above a person wishing to be registered in the field of Environmental Science should be able to provide proof of training in Environmental Management (e.g.: environmental impact assessment, environmental law, etc.). These can either be part of the four-year degree programme or by way of accredited short courses.**
5. In order to qualify for the field of practice of Environmental Science an applicant must have a **clear record of environmental science related work and research**. Such a person may also do the broad scope of what environmental practitioners do.

6. **Environmental Facilitators**, who has completed some courses in environmental management, but do not have the required natural science training, e.g. town planners, sociologists, economists, architects, and geographers with B.A. degrees, **will not qualify for registration as professional natural scientists**. Such Environmental Facilitators should have persons with natural science training in their teams.
7. **In considering the vocational experience of applicants, the following would be taken into consideration:**
 - 7.1 Ability to think holistically about the structure, functioning and performance of the environmental system, not simply focusing on maximising the efficiency of one of its elements.
 - 7.2 Analysis of environments potentially subject to change in such a way as to identify significant issues, problems and/or characteristics, and distinguish between underlying causes and superficial symptoms.
 - 7.3 Proficiency in integrating and co-ordinating significant components of both the socio-economic and biophysical environments in such a way as to evaluate options and trade-offs, and facilitate sound decision-making.
 - 7.4 Ability to make balanced judgements and objectively evaluate alternatives.
 - 7.5 Application of tools contained in the Integrated Environmental Management 'toolbox', including:
 - (a) Scoping and public participation.
 - (b) Systematic and explicit assessment and evaluation of environmental impacts.
 - (c) Mitigation and optimisation of impacts.
 - (d) Monitoring and evaluation of impacts.
 - (e) Preparation of environmental management plans or programmes.
 - (f) A thorough understanding of the concept of sustainable development, embracing:
 - (i) Ecological sustainability, recognised as the enabling factor for sustainable development.
[That is, the maintenance of life-support systems and biodiversity on which development depends should be seen as a priority, and a risk-averse and cautious approach should be followed where there is uncertainty about impacts on the natural environment].
 - (ii) Social sustainability equity and environmental justice.
 - (iii) Economic efficiency.
 - (g) A sound working knowledge of environmental legislation and policy.
 - (h) Ability to manage competently an interdisciplinary team.
 - (i) Ability to recognise when to involve specialists, to select and appoint appropriate specialists, and to draw up sound Terms of Reference for these specialists that address the particular needs of that project or piece of work.
 - (j) Proficiency in interpersonal and communication skills, both in oral and written form.
 - (k) Applicants will have to provide proof of their personal involvement in at least two or more projects.
 - (l) Projects completed (reports) will be considered, provided that a clear substantiated indication is provided of personal contribution.
 - (m) Registration by the EAPSA will be deemed as sufficient proof of the above. In addition, information must be provided of conferences attended; scientific papers and publications.

Forensic Science

1. In order to qualify for registration in the field of practice Forensic Science, the following requirements must be met:
 - 1.1 Any person who wishes to be registered as a Professional Natural Scientist in the field of practice Forensic Science should have a four-year B.Sc, B.Sc. Honours or B.Tech. degree in the natural sciences.
 - 1.2 Such qualification shall include **at least one** subject, from the fields of practice listed in Schedule I to the Act; must be studied in increasing depth and breadth over four years; and must be based on **at least two** of the appropriate level-I basic natural science subjects of physics, chemistry, mathematics and/or biology.
 - 1.3 **At least 50 % of the subjects in the programme must be classified as natural science subjects. (Also see requirements on pp. 8 - 10.)**
2. **Additional training:**
 - 2.1 In addition to the above a person wishing to be registered in the field of Forensic Science should be able to provide proof of training in Forensic Science or Investigations e.g.:
 - (a) Document examining, Fire investigation, Tool Mark investigation, Prosecution investigation, law and court procedures, expert witness, or other accredited short courses.
 - (b) In order to qualify for the field of practice of Forensic Science an applicant must have a clear record of forensic science related work and research.
3. **Areas of knowledge that is essential to the forensic science practitioner:**
 - 3.1 Forensic coursework programmes: It is important that the forensic scientist-in-training develops an understanding of the areas of knowledge that are essential to Forensic Science and acquires skills and experience in the application of basic forensic concepts:

- (a) Courtroom testimony
- (b) Introduction to law
- (c) Quality assurance
- (d) Ethics
- (e) Professional practice
- (f) Evidence identification, collecting, and processing
- (g) Scientific and laboratory problem-solving skills
- (h) Application of science to the processes of law
- (i) Forensic investigative techniques
- (j) Crime scene investigation
- (k) Physical evidence concepts
- (l) Analytical chemistry and instrumental methods of analysis
- (m) Drug, chemical toxicology, microscopy, and materials analysis
- (n) Forensic biology

4. **Work experience**

- 4.1 Firearms: examination and classification of weapons/ammunition; linking the weapon to the crime, attending crime scenes, evaluate potential of the forensic evidence.
- 4.2 Accident investigation: technical support in the investigation of road traffic accidents, reconstruction of events leading up to a collision, detailed examination of vehicle components, some knowledge of automotive technology. (Qualifications in physics or materials science would be appropriate.)
- 4.3 Fire investigation
- 4.4 The study of question documents – handwriting identification.
- 4.5 Optimising the location and recovery of evidence.
- 4.6 Maximising the value of evidence
- 4.7 Scientific writing.
- 4.8 Forensic-related research.
- 4.9 Experience in a laboratory environment.
- 4.10 Biological- and chemistry-based analytical work.
- 4.11 Attend crime scene in advisory capacity.
- 4.12 Supervisory responsibility within laboratory examining contact material associated with crimes.
- 4.13 Analyses – biology, chemistry, drugs and toxicology
- 4.14 Impartial scientific evidence in courts of law to support the prosecution or defense in criminal investigations.
- 4.15 Photographic (digital) work.

Qualifications not recognised for registration purposes

B.A. degrees.

B.Sc. Engineering degrees.

3-year B.Agric. degree, if Mathematics I, Chemistry I, Physics I or Biology I did not form part of the curriculum.

B.Agric. Management

B.Inst.Agrar. following on a 3-year B.Sc. in Agriculture or B.Agric.

All undergraduate qualifications not based on the level-I basic science subjects (Chemistry I; Physics I; Mathematics I; Biology I).

B.Tech. & N.H.Dip.: Chemical Engineering

N.H.Dip : Community Nursing

N.Dip. : Community Extension

N.H.Dip. & B.Tech: Environmental Health

N.H.Dip: Nature Conservation: Environmental Education

N.H.Dip: Nature Conservation: Veld and Game Management

N.H.Dip: Nature Conservation: Coastal & Marine Management

N.H.Dip.: Nature Conservation: Fresh-water Management

Masters degrees: Following on B.Sc. degrees, that does not comply with the 4-year level requirement. (Masters in Environmental Management, UFS; Masters in Sustainable Development)

M.Phil.: Wildlife Management University of Pretoria (following on a 3-year B.Sc. or other 3-year qualifications, e.g. N.Dip.)

Registration requirements

Professional Natural Scientist (Pr.Sci.Nat.)

1. Any person who holds an appropriate **four-year degree/diploma in the natural sciences** from a South African university, university of technology or a technikon (or a similar institution), which is accredited by the Higher Education Quality Committee (HEQC) of the Council for Higher Education (CHE) and by the Education Committee of SACNASP, shall be eligible for registration. **(Also see qualifications not acceptable for registration purposes - p 7.)**
2. In addition to the above a **minimum of three years** appropriate work experience of a natural scientific nature **(see NOTE below)**, is required. Full details must be submitted. **(See 3.2 on p. 3.)**
3. **Referees**
- 3.1 The names of two referees **who can attest to the applicant's abilities is required.** (See application form for details.) **At least one of the referees should be registered with SACNASP.**
- 3.2 It is expected that referees should have personal knowledge of an applicant's character as well as of his experience in the natural sciences. Referees may be chosen in the following order of preference:
 - (a) Head of organisation.
 - (b) Immediate supervisor.
 - (c) Professor or Head of Department at a university/university of technology/technikon.
 - (e) Mentors.
 - (f) Clients.

Qualification requirements	Experience requirements
Minimum academic qualification	Minimum number of years vocational experience after the minimum qualification was obtained.
1. 4-year B.Sc. or B.Sc. Agric. B.Sc. Honours N.H.Dip./B.Tech.	Three subsequent years appropriate vocational experience in the field of practice applied for.
2. M.Sc./M.Tech. (M.Phil. not equivalent to M.Sc.)	Two subsequent years appropriate vocational experience in the field of practice applied for.
3. D.Sc./Ph.D./D.Tech.	One subsequent year appropriate vocational experience in the field of practice applied for.
NOTE: For registration purposes the vocational experience should be gained after the minimum qualifications were obtained. If the applicant, however, was in a full-time occupation and obtained a M.Sc., Ph.D. or M.Tech degree in the natural sciences while studying part-time, vocational experience in the natural sciences gained during this period, shall be taken into consideration. Research or experience gained while studying full-time, however, is not acceptable.	
Basic pattern of study	
Year of study	1 2 3 4 5 6 7
Subject level	I II III IV M.Sc./ M.Tech. Ph.D./ D.Tech.
	Broadening and deepening Minimum years of study for registration as a Candidate Natural Scientist Specialisation

Degree programme content

1. The degree or diploma held by an applicant applying for registration shall be composed of subjects or modules of which **at least 50 % of the total credits can be classified as natural science subjects or modules.**
2. Such qualification shall include at least **one subject from the generic fields of practice listed in Schedule 1 of the Act; must be studied in increasing depth and breadth over FOUR years and must be based on at least two of the appropriate level-I basic natural science subjects of physics, chemistry, mathematics and/or biology.**
3. In cases where the appropriate natural science requirement is not met, an additional period of study shall be required to achieve the appropriate natural science content.

Candidate Natural Scientist (Cand.Sci.Nat.)

1. A candidate Natural Scientist is a person who intends to register as a Professional Natural Scientist (Pr.Sci.Nat.) **after completion of the appropriate three years vocational experience as may be required. (Please also refer to pages 11 - 12 for notes about experience requirements.)**
2. Any person who holds an **appropriate FOUR-year degree or diploma in the natural sciences** from a South African university, university of technology or a technikon (or a similar institution), which is accredited by the Higher Education Quality Committee (HEQC) of the Council for Higher Education (CHE) and by the Education Committee of SACNASP, shall be eligible for registration. **(Also see qualifications not acceptable for registration purposes - p 7.)**

3. **Referees**
- 3.1 The names of two referees **who can attest to the applicant's abilities is required. At least one of the referees should be registered with SACNASP.** In some instances registration with ECSA could be appropriate too.
- 3.2 It is expected that referees should have personal knowledge of an applicant's character as well as of his experience in the natural sciences. Referees may be chosen in the following order of preference:
- Head of organisation.
 - Immediate supervisor.
 - Professor or Head of Department at a university/university of technology/technikon.
 - Mentors.
 - Clients.
4. **Appointment of a mentor**
- 4.1 An applicant registering as Candidate Natural Scientist has to identify a mentor who will ensure that the experience gained by him or her is appropriate for registration purposes.
- 4.2 The mentor should, ideally be a Professional Natural Scientist who holds a position of responsibility.
- 4.3 The advice of a mentor is not legally binding on the South African Council for Natural Scientific Professions in respect of which body is the final authority on all matters pertaining to the registration, although a mentor's advice will carry weight with the Council.
5. **Training programme**
- 5.1 An appropriate training programme, that meets the requirements for registration, should be followed.
- 5.2 At the end of the training period, when the Candidate Natural Scientist applies for registration as Professional Natural Scientist, it will be expected of the mentor to submit a short report on the training undergone by the candidate, that can be used by the Professional Advisory Committee (PAC) in the evaluation of the application.
6. **Vocational Training requirements**
- 6.1 The Council requires that a prospective applicant must be trained to its satisfaction in the application of natural scientific principles and methods within his or her field of practice of the natural sciences, and be given progressively more responsibility until he or she is capable of accepting professional responsibility in making and executing natural scientific decisions.
- 6.2 **For registration purposes the vocational experience should be gained after the qualifications were obtained.**
- 6.3 If the applicant, however, was **employed on a full-time basis** and obtained an M.Sc., Ph.D. or M.Tech degree **while studying part-time**, vocational experience gained during this period, shall be taken into consideration. Research or experience gained while studying full-time, however, is not acceptable.
- 6.4 **Responsibility of the Candidate Natural Scientist**
- A Candidate Natural Scientist should appreciate that the **onus is on himself or herself to ensure that the training he or she receives will meet the requirements.**
 - The Candidate Natural Scientist has a responsibility during training to ensure that:
 - his or her work is supervised by a competent person, preferably a Professional Scientist;
 - he or she continues to upgrade his or her knowledge, recognising that the profession of natural scientist is in a continual state of development;
 - he or she develops his/her communications, managerial and professional skills in support of his or her increasing responsibilities; and
 - he or she conducts himself or herself in a manner that ensures his or her integrity and enhances the profession of Professional Natural Scientist.
 - the ethical code of conduct is followed and adhered to.
 - In assessing training the Council will consider the nature and standard of the training; advanced studies during or before the training period; and natural science publications.
- 6.5 **Essential elements of acceptable training (Also see guidelines on acceptable vocational experience – pp. 11 - 12.)**
- Acceptable training in natural scientific work shall give the Candidate Natural Scientist satisfactory experience in the application of the natural scientific principles and methods learned during his or her academic education and shall preferably include:
 - Work requiring the solution of problems in connection with natural scientific tasks or projects involving natural scientific judgment in -
 - * problem identification and formulation;
 - * finding, selecting and effective using of relevant information;
 - * analysing of factors affecting possible solutions.
 - Problem solving: relevant scientific principles; practical economic, social and statutory requirements and constraints.
 - Planning, design, communication: work on the development of the proposed solution to a communicable, detailed form for those who have to execute it, e.g. by means of specifications, reports, or other means of communication.
 - Execution: work on the executing of tasks or projects, e.g. operation or maintenance, involving the effective employment of human resources, materials, machines and money, with due cognisance of their interaction.
 - Responsibility: The work shall involve progressively greater responsibilities until the applicant is demonstrably capable of accepting professional responsibility in making and executing natural scientific decisions. The degree of responsibility carried by the applicant should be indicated in the report accompanying the application.

Qualification requirements (No experience needed)

4-year B.Sc. or B.Sc. Agric. B.Sc. Honours N.H. Dip./B.Tech.	M.Sc./M.Tech.				D.Sc./Ph.D./D.Tech.		
Basic pattern of study							
Year of study	1	2	3	4	5	6	7
Subject level	I	II	III	IV	M.Sc. M.Tech.		Ph.D D.Tech.
	Broadening and deepening Minimum for registration as Candidate Natural Scientist.				Specialisation		

Degree programme content

- The degree or diploma held by an applicant applying for registration shall be composed of subjects or modules of which at least 50 % of the total credits can be classified as natural science subjects or modules.
- Such qualification shall include at least **one subject from the fields of practice listed in Schedule 1 of the Act; must be studied in increasing depth and breadth over FOUR years and must be based on at least two of the appropriate level-I basic natural science subjects of physics, chemistry, mathematics and/or biology.**
- In cases where the appropriate natural science requirement is not met, an additional period of study shall be required to achieve the appropriate natural science content.

Certificated Natural Scientist (Cert.Sci.Nat.)

- Any person who holds an appropriate THREE-year degree/diploma in the natural sciences from a South African university, university of technology or a technikon (or a similar institution), which is accredited by the Higher Education Quality Committee (HEQC) of the Council for Higher Education (CHE) and by the Education Committee of SACNASP shall be eligible for registration. **(Please see qualifications not acceptable for registration purposes p. 7.)**
- In addition to the above a **minimum of one year** appropriate work experience of a natural scientific nature (**see NOTE below**), is required.

Qualification requirements Experience requirements

Qualification	Experience requirement		
3-year National Diploma (N.Dip.) 3-year Bachelor's Degree (B.Sc.)	One subsequent year appropriate experience in the field of practice applied for. NOTE: For registration purposes the vocational experience should be gained after the qualification was obtained.		
Basic pattern of study			
Year of study	1	2	3
Subject level	I	II	III
	Broadening and deepening		

Degree programme content

- The degree or diploma held by a person applying for registration shall be composed of subjects or modules of which at least 50 % of the total credits can be classified as natural science subjects or modules.
- Such qualification shall include at least **one subject from the fields of practice listed in Schedule 1 of the Act; must be studied in increasing depth and breadth over THREE years and must be based on at least two of the appropriate level-I basic natural science subjects of physics, chemistry, mathematics and/or biology.**
- In cases where the appropriate natural science requirement is not met, an additional period of study shall be required to achieve the appropriate natural science content.

Vocational experience

Guidelines on qualifying vocational experience for registration purposes

1. Applicants that are operating on a decision-making level should have been responsible for the drafting of guidelines in the decision-making process and responsible for the affects of their decisions.
2. If employed in an advisory capacity, he/she should indicate to what extent his/her peers in the organisation, or his/her clients:
 - 2.1 depend on his/her professional advice en expertise for which he/she could be kept responsible, or
 - 2.2 if he/she has done research, which has lead to publication(s) in an established science publications or papers.

Earth Sciences

1. Recognition of experience in the earth science professions include the need to identify satisfactory practical exposure and competence in several of the employment-relevant skills that are listed in each of the flowing six general fields of earth science practice:
 - 1.1 Mapping: field mapping, regional and detailed; underground mapping; borehole logging; litho-stratigraphic principles; structural interpretation; data compilation and presentation; appropriate survey methods; photogeology; orthophoto mapping remote sensing; practical cartography.
 - 1.2 Sampling techniques: practical sampling methods; geostatistics; data discrimination and evaluation; data interpretation and presentation.
 - 1.3 Analytical techniques: laboratory methods applicable to one or more of – economic, mining and exploration geology; engineering geology; environmental geology; geomorphology; geochemistry and mineralogy; geohydrology; geophysics; earth science research.
 - 1.4 Computer literacy: DOS; Windows; Spreadsheets; GIS; applied geological modelling.
 - 1.5 Communication: report writing; verbal presentation; confidentiality; professional ethics.
2. In addition to this broad exposure, more detailed or employment-specific skills and competence will be acquired by earth scientists according to their particular fields(s) of practice. In general terms, these fields may be classified broadly as: mining geology; exploration geology; geophysics; environmental geology; engineering geology; mineralogy and geochemistry; geohydrology; research geology and earth science.

Geohydrologist or Hydrologist

Guidelines for the recognition of qualifying experience in the earth science professions depend largely on the specific discipline within the wider earth science context. The guidelines expressed in this document specifically refer to the profession of geohydrologist or hydrologist. Broad categories within the field of geohydrology have been identified and applicants are required to gain satisfactory practical exposure and competence in several of the employment-relevant skills areas of geohydrological practice listed below.

Aquifer characteristics:

Conducting aquifer tests; interpretation of aquifer test results; aquifer recharge; terminations; tracer experiments; resource determinations, etc.

Hydrogeochemistry:

Design of ground water monitoring programmes; evaluation of ground water quality from analytical results; advise on and conduct aquifer remediation.

Geohydrological mapping:

Hydro-census; integrating geological, geohydrological and other relevant information application of computer techniques in map production; assessment of vulnerability of aquifers; assessment of exploitation potential, recharge to, water quality, vulnerability, etc. of aquifers.

Development of water supply schemes from ground water sources, e.g.

Assessment of water supply needs; conducting hydro-census; selection of drilling targets by applying geological knowledge, geophysical techniques, air photo interpretation, etc.; designing of well fields, specifying details of production and monitoring boreholes, design and interpret aquifer tests, pump selection, etc.

Development of production and monitoring boreholes, e.g.

Supervision of borehole drilling; development of boreholes; installation of pumping and/or monitoring equipment; conduct aquifer tests, etc.

Environmental geohydrology, e.g.

Description of affected geohydrological environment; assess impact of development on geohydrological conditions; recommend monitoring programme; recommend mitigating actions, etc.

Aquifer modelling, e.g.

design criteria and selection of appropriate modelling code; design of model and simulation network calibration of model; interpretation of model results, etc.

Ground water management, e.g.

Development of aquifer specific ground water management criteria; design of appropriate monitoring criteria; evaluation of monitoring results; recommend management actions, etc.

Communication e.g.

Compilation of geohydrological reports on specific investigations; verbal presentation of results; professional ethics and confidentiality, etc.

Engineering Geologists

Foundation studies of dams, buildings, tunnels and excavations; dolomite studies; slope stability studies; engineering geological mapping; location or testing construction materials; environmental impact studies; and teaching and research in engineering geology.

Lecturing

Lecturing, in a full-time or part-time capacity presented as occupational experience, should include research which is recorded and can lead to the publication in a acknowledged science publication, or is of a standard acceptable to the Council. In addition, the applicant should also have been responsible for lecturing on a postgraduate or equivalent level in one or more of the natural science fields and/or have given guidance with respect to Masters or Doctorate dissertations or research dissertations, which are acceptable to the Council.

Mathematical Sciences

Supervising of Masters and Doctorate dissertations/theses; independent performing and/or supervising of research projects, developmental projects and consultation work in which the principals, methods and techniques of one or more of the different mathematics science fields were applied.

Physical Sciences

1. An applicant should demonstrate through his/her experience his ability to inventively fulfil his profession. In natural scientific work three experience activities can be identified:
 - (a) Logistics (e.g. the use and development of infrastructure) ;
 - (b) Technology (e.g. development, handling and use of facilities, such as apparatus and software); and
 - (c) Communication (including reports and/or publications).
2. Research done should clearly point out the part and responsibilities in which the applicant was involved.
3. In publications where he/she was a co-author his/her part/role must be clear.
4. If lecturing, innovation should be clearly visible as well as guidance to students in problem solving, practical application of theory and in research.
5. In consulting work the responsibility with which he/she uses his/her knowledge is important and innovative development of his/her knowledge and the use thereof should be clear.
6. Training programmes should be acceptable to the PAC, e.g. the ESKOM programmes which are developed for the needs of the physical scientist-in-training.

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Code of professional conduct

A professional natural scientist or a professional natural scientist-in-training or professional natural science technologist or professional natural science technologist-in-training shall in practising his profession comply with the following code of conduct:

1. He shall have due regard to public safety, public health and public interest generally.
2. He shall discharge his duties to his employer or client in an efficient manner and with integrity.
3. He shall order his conduct so as to uphold the dignity, standing and reputation of the profession.
4. He shall not undertake professional natural science work of such a nature that his education, experience or background have not rendered him competent to perform it.
5. He shall disclose to his employer or client, in writing, any substantial interest he may have in any company, firm or person carrying on any contracting, consulting work or manufacturing business which is or may be related to the work for which he is employed, as well as particulars of any royalty accruing to him from any article or process used in or for the purpose of the work in respect of which he is employed.
6. Subject to rule 5, he shall not receive, either directly or indirectly, any gratuity, commission or other financial benefit in respect of any article or process used in or for the purpose of the work in respect of which he is employed, unless such gratuity, commission or other financial benefit has been authorised, in writing, by his employer or client.
7. He shall not maliciously or recklessly injure, either directly or indirectly, the professional reputation, prospects or business of any other professional natural scientist or professional natural scientist-in-training or professional natural science technologist or professional natural science technologist-in-training.
8. He shall not knowingly attempt to supplant another professional scientist or professional natural scientist-in-training or professional natural science technologist or professional natural science technologist-in-training in a particular engagement after a formal offer has been made to employ the latter.
9. He shall not advertise his professional services in a self-laudatory manner or that is derogatory to the dignity of the profession.
10. He shall not misrepresent or permit misrepresentation of his or his associates' academic or professional qualifications nor exaggerate his or their degree of responsibility for any work of a professional natural scientific nature.
11. He shall not, without a satisfactory reason, destroy calculations or documentary or other evidence required for the verification of his work.
12. He shall neither personally nor through any other agency attempt to obtain consulting work by way of touting or bribery.
13. He shall order his conduct in connection with professional natural scientific work outside the borders of the Republic of South Africa in accordance with these rules in so far as they are not inconsistent with the law of the country concerned: Provided that where there are recognised standards of professional conduct in a country outside the Republic, he shall also adhere to those standards.

Glossary and definitions

Consultant:

A consultant is a person qualified in terms of the Act (Act 27 of 2003) to give expert advice in his or her field of practice.

Earth Science:

The field of practice Earth Science includes (but may not be limited to):

Geophysicists; Seismologists; Palaeomagnetists; Rock Mechanical Scientists; Engineering Geologists; Environmental Geologists/Geophysicists; Geostatisticians; Geohydrological Scientist (Geohydrologists; Hydrogeologists; Environmental Geologists specialising in waterborne pollution).

Ecological Science:

Ecology is essentially a multi-disciplinary science concerned with the relationship between organisms and between organisms and their environment, in which the emphasis may be on whole organisms, populations, communities or ecosystems. It is also the scientific study of the interactions between man, living organisms and the abiotic environment (habitats) with one another and with their non-living environment of matter and energy. It concerns to a large extent the structure and function of nature.

An **ecologist** is someone who has received an appropriate comprehensive training and has experience in biological studies and the analysis of the responses of organisms to the environment and to each other.

Environmental Science:

Environmental science is a multi-disciplinary science concerned with the relationship between elements of the natural environment, and the interaction between man and the environment, in which the emphasis is placed on the elements of the ecosystem. It can also be defined as the study of how man and other species interact with one another and with the non-living environment of matter and energy. Environmental science includes both natural and social sciences that integrates a wide range of disciplines including: physics, chemistry, biology, geology, geography, resource technology, engineering, resource conservation, population dynamics, economics, politics, sociology, psychology and ethics. It is the study of how nature and humans operate and interact and the controlling mechanisms for interaction verification. (SACNASP is, however, concerned with the natural sciences only. See Registration Requirements, page 5).

An **environmental scientist** is someone who has received an appropriate comprehensive training and has experience in environmental studies, the analysis of the responses to change of the natural environment and the examination of the inter-relationships between all aspects of the natural environment.

An **environmental assessment practitioner** is someone who has received appropriate interdisciplinary training covering both the natural and human environment and has experience in environmental management, environmental assessment and related studies. The term environmental assessment practitioner therefore does not apply to specialists in particular fields who may be involved in, or asked to give input to, particular stages of an environmental assessment from the perspective of his/her field of expertise.

Expert (scientist):

An expert is someone who has studied a particular subject and has in-depth knowledge about it.

Expert witness:

An expert witness is someone who may give an opinion in a court of law in his or her own capacity.

Forensic Science:

Forensic Science is the application of science to a specific set of questions which has a legal (civil or criminal) outcome in the furtherance of legal procedures.

Forensic Geology is the application of earth sciences principles to the needs of the law enforcement community. Investigators must properly utilize all of the tools available in the field to explore all of the potential avenues of investigation.

Forensic Scientist:

A forensic scientist examines physical evidence and then gives expert testimony about the results of the examination in court and provides interpretations or opinions regarding the results.

Geological Science:

The field of practice Geological Science includes (but may not be limited to):

Structural geologists; Mapping geologists; Mineralogists; Petrologists; Economic Geologists; Mining Geologists; Exploration Geologists; Geochemists; Palaeontologists

Natural Science:

Natural Science means the science of nature (as distinguished from social science).

Profession:

A profession is an occupation that involves intellectual activity and provision of a service to the public and requires a higher education, or refers to a limited number of occupations of which the functioning is regulated.

Factors that determine the standing of a profession:

A set of values inherent to the service nature of the profession.

A body of knowledge arrived at through continued applied and scientific research and logical analysis.

An established and formal educational process.

Standards of professional qualification for admission.

Formal recognition of the status of the profession.

A code of ethics.

Existence of a strong voluntary organisation or professional association.

Personal qualities beyond technical competence.

Professional:

A professional is someone who has as an occupation that requires special training and has a fairly high status.

Science:

Science is the systematic describing and often also explaining of how and why events happen:

* Forming an idea of the way in which something works and formulating a hypothesis.

* Making careful measurements, experiments or observations to test the hypothesis.

* If evidence keeps agreeing, the hypothesis becomes believable and proven.

* A theory is a hypothesis (or hypotheses) that has (have) stood the test of time.

* This leads to a law which is fact, such as Newton's second law of motions, or Boyle's law of gasses, or Mendel's law of heredity. A law always continues to fit the evidence

Qualified:

Someone who is qualified has passed the examinations that they need to pass in order to work in a particular profession. If someone is qualified to do something he or she has the qualities or skills and capacity necessary to do it.

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