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*HSRC Guidance Series GS-4*

**tertiary training outside  
universities and career  
opportunities**

**human sciences research council**

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SOUTH AFRICAN HUMAN SCIENCES RESEARCH COUNCIL

*HSRC Guidance Series GS-4*

**TERTIARY TRAINING OUTSIDE UNIVERSITIES  
AND CAREER OPPORTUNITIES**

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## P R E F A C E

Fundamentally, any country is dependent for its progress on the brainpower, capacity for work and dedication of its people. For a developing country such as South Africa, training after Standard Ten is essential in order to utilise its available human potential to the utmost. This implies first of all university training at the highest level, but, because of diversified needs, high demands are also imposed on technically qualified personnel who do not, or do not need, to study at a university.

This book, No. GS-4 in the HSRC's Guidance Series, is a revised edition of Tertiary training outside universities and career opportunities which was published in 1973. It provides, in a systematic and comprehensive manner, essential basic information and guidance to senior high school pupils with regard to non-university training and career opportunities. An indication of what is offered by universities is only given in the case of teacher training.

This book and two other publications in the Guidance Series, University training and career opportunities (GS-5) and Training and career opportunities for school-leavers before Standard Ten (GS-3), provide information on training and career opportunities over a very wide field.

The most recent available information is provided, but it should be remembered that training is not static. Although the compilers make no claims as to completeness, the information is reliable, at least for the present. With regard to the section on Vocational Service, it should be pointed out that the book is not a commercial publication. References to employers from the private sector therefore had to be restricted to the absolutely essential minimum.

Thanks are due to all bodies which co-operated wholeheartedly in supplying information. Particular mention must be made of the Department of National Education, the colleges for advanced technical education, technical colleges and technical institutes, for their wholehearted co-operation in making available the most recent authoritative information; the Department of Labour and the editorial staff of the periodical My Career; the Public Service Commission, for direct information as well as information obtained from the publication Careers in Government Departments; various government departments; the provincial education departments for information on teacher training and the professional bodies and other training institutions which offered their co-operation.

The Human Sciences Research Council trusts that this publication will render a contribution to assist our young people in finding their way into the adult world without necessarily having to attend a university. The possibilities are virtually unlimited, if only they knew about them.

  
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## T E R T I A R Y   T R A I N I N G   O U T S I D E   T H E   U N I V E R S I T Y

## 1. DIFFERENTIATED DEMAND FOR MANPOWER

The rapid economic development of the RSA in general, and of its industries in particular, over the past decades, is indeed something remarkable. The statement is heard more and more often that South Africa is changing from an agricultural and mining country to an industrial one. New enterprises are being initiated and established, and an ever growing percentage of the population is required for professional, technical and social services. Increased automation and the major role played by technology also demand higher standards in respect of academic and technical training and for this the country has to rely on those who have the necessary ability, aptitude and interest. A country's progress indeed depends, first and foremost, on the brainpower, capacity for work and dedication of its people.

However, a country's progress is not guaranteed only by the manufacturing industries. Long before an economy can be built on the manufacturing industry, there has to be an appropriate infrastructure with all its related services. Transport systems (road, rail, air and sea) are essential. There must be a post and telecommunications system, electric power, water supply and public services. It is this infrastructure and the development and modernisation of such systems and services which also in South Africa make particular demands on technically trained manpower.

On account of the differentiated requirements of the country, the exploitation and development of its manpower potential cannot be dependent only on university training. The latter is obviously training at the highest level, but it is not 'better' than other training. It will indeed be better for students who run the risk of failing in their first year at university - and the number of first-year failures in South Africa is disturbingly high - to go to some other training institution, for example a college for advanced technical education. There is scientific proof that the large majority of first-year failures would have successfully completed courses similar to those they failed in at university, if they had taken them at some other institution. This training is by no means inferior, only different, that is, it is directed more towards the application of knowledge than towards knowledge as such. Moreover, as previously indicated, the country needs a large variety of trained manpower in all possible fields, and besides, labour in all its forms is honourable. Timely testing, for example for aptitude and interest, as well as a comprehensive knowledge of possible career opportunities and effective vocational guidance will largely assist students in making the correct choice as regards training and careers.

There is no doubt that we are living in a world of specialization. The South African labour market is also experiencing, as never before, a greater demand for trained persons with specialized knowledge and recognized qualifications in a very wide field. And specialization demands purposeful training. Accountants, for example, are not born as accountants, neither, for that matter, are scientists, technicians or any other of the many occupationally qualified persons. Man does, however, possess possibilities which can be successfully exploited and developed by means of training. It is only by effective training, dedication and hard work that the demands of a career can be satisfied and advanced levels of important and lucrative posts attained.

## 2. TRAINING INSTITUTIONS

Tertiary training is offered by various organizations and at various institutions outside the universities, for example at the provincial teacher training colleges (see Chapter V); the training centres for nurses, physiotherapists, occupational therapists and centres for other ancillary health services; the college for foresters; agricultural colleges; the training centres of the police, the defence force (army, navy and air-force), the Department of Prisons and several others. Since these centres will be discussed under their particular sections, a brief description of some of the centres under the control of the Department of National

Education, as well as of the services of the private correspondence colleges, will suffice here.

(i) Colleges for advanced technical education

At present there are six colleges for advanced technical education in the RSA. They are situated in Cape Town, Durban, Johannesburg, Port Elizabeth, Pretoria, and Vanderbijlpark. These institutions concentrate on advanced training and teaching at post-Std X level, i.e. at the level of tertiary or higher education. They are autonomous institutions, like universities, are subsidised by the Department of National Education and offer a wide variety of technical, commercial and other courses on a full-time, part-time and sandwich basis. The courses are arranged as far as possible on a practical and academic basis. This training enables the candidate to enter commerce and industry directly and to perform his task effectively. There is no large gap between the theoretical education and the demands of the practical situation.

(ii) Technical colleges

The colleges for advanced technical education are no longer concerned with the training of apprentices at pre-Std X level. There are technical colleges for this purpose, a large number of which were previously apprentice schools. The main function of these institutions is to provide theoretical apprentice training for candidates who normally leave school at an early stage and have to serve their apprenticeship in the various trades in industry. It can generally be stated that apprentices should, at least, no longer be of school-going age when they are admitted to a technical college.

There are 26 larger and smaller technical colleges in the country. They are polytechnic in nature in the sense that they offer a variety of technical and commercial courses on a full-time and part-time basis. Many of the courses offered by the colleges for advanced technical education are also provided by the technical colleges.

(iii) Technical institutes

Continuation classes in technical and commercial subjects were established to fulfil the need felt by young employees and adults to increase their knowledge and improve their qualifications, in centres not served by institutions for vocational training. In the course of time the continuation classes, which are now known as Technical Institutes, have expanded to such an extent that they have their own buildings and a full-time staff and thus provide opportunities for post-school technical training at no fewer than 34 centres. Whereas technical colleges are government institutions with advisory councils, technical institutes are government-subsidised institutions under the control and management of their own councils. There is no difference with regard to the content and standard of instruction. The latter group in turn may develop into fully fledged technical colleges and later even into colleges for advanced technical education.

Pupils are prepared for the National Commercial and Technical Examinations at the technical institutes and by means of the subject-success system it is possible for them to obtain the complete certificate in stages. The technical institutes also provide training for apprentices.

(iv) Correspondence colleges

Education through correspondence is extremely important in South Africa, since for many students it is the only way in which they can improve their qualifications. Nowadays the colleges are successful in maintaining a high standard of training by virtue of excellent organization, realistic fees, modern teaching methods and the opportunity to make a selection from a large number of fields of study. The interests of students are protected by the Correspondence College Council. This statutory body was established by law in 1965 with the aim of controlling the standard and services of the colleges. All private correspondence colleges have to be registered with the Council.

Most of the colleges make provision for technical courses up to various levels,

secretarial and commercial courses which lead to the national diplomas and certificates and for the courses of some of the professional institutes. In addition, the majority of these institutions also offer courses for their "own" diplomas and certificates on a non-examination basis. Practically all individual subjects, as well as various general courses for men and women are catered for at most of the colleges.

It is well-nigh impossible to publish a complete list of all the courses offered by every correspondence college. Further particulars can be obtained direct from the colleges. There is a list of the names and addresses of registered colleges on p. 218.

### 3. SYSTEMS OF TRAINING

The systems of training followed by colleges for advanced technical education, technical colleges and technical institutes for the national diploma and certificate courses, involve the integration of theory and practice. Some courses are offered on the semester basis, while others, for example in the engineering field, are offered on the trimester basis.

The systems are the following:

- (i) Sandwich courses: This system consists in college attendance of one semester or one or more trimesters a year. The rest of the year is devoted to practical in-service training with an employer. Examinations are written at the end of each semester or trimester. Sandwich courses are intended mainly for technicians and usually cover three or four years. Although it is not always required, candidates are normally in the first instance in the service of an approved employer.
- (ii) Full-time courses: In this case the student attends classes at a college for a year or longer on a full-time basis, that is, he does not fill a post which occupies a part of his time. There are full-time courses which last one, two or three years, while other courses are arranged in such a way that, for example, the student attends classes for three consecutive semesters (18 months) and afterwards receives practical in-service training for three semesters in order to satisfy the requirements for a particular diploma or certificate. Similar arrangements are sometimes made for trimester courses.
- (iii) Part-time courses: This system makes provision for persons who are employed on a full-time basis to improve their qualifications. Classes are attended after working hours (usually from 17h00 to 19h00 or later) or for eight hours on one day of the week.
- (iv) Block-release system: This system has been designed mainly for apprentices and require full-time attendance at a college for approximately 11 weeks followed immediately by an examination period of about two weeks.

### 4. CHOOSING A FIELD OF STUDY

In an ever developing and changing community, young people have the difficult task of choosing a suitable field of study and career from among the numerous possible fields. There is no doubt about the momentous importance of a choice, as a career does not simply determine what a person is going to do one day, but also the kind of people he will have to work with, his home and place of work, his level of income, but especially whether lasting satisfaction from his career will be his share in life. Furthermore, in our age there is simply no time or place for failures. The price which must be paid for failure is much too high, since the person who does not equip himself for better things will have to be satisfied with an inferior position in the social and economic sphere. One important cause of failure is insufficient or even incorrect training.

The facilities for training people are there. The potential human material is also there, but it is often not channelled into the correct training institutions. More-over too many students decide to take the "easiest" course without taking into consideration the demands made by professional life or the career possibilities. Such students are bound to be disillusioned, frustrated and incompetent when they enter the practical world. The reverse is also true; hard work during training is usually rewarded by occupational satisfaction.

Planning a career necessitates an evaluation of the individual's interest and capability, as well as the demands made by a particular career or occupational field and the field of study which will have to be taken. A large measure of interest in an occupational field, although important, is, however, not sufficient on its own to justify a choice of career. Aptitude and ability are also required. Naturally, the reverse is also true: a person may have all the necessary ability and aptitude for a certain profession, but may nevertheless not be interested in it. What is required, therefore, is a choice which will be marked by the highest correlation between aptitude and ability for a specific career on the one hand, and on the other hand interest in as well as a sound knowledge of the demands made by that career and the possibilities of promotion.

However, pupils are today in the privileged position and are also constantly encouraged to make use of the many guidance opportunities which are at their disposal. To start with, the candidate should examine himself with questions such as: Does my school achievement provide an indication of the field of study which I should follow? In what school subjects or fields of study do I obtain the best results? What am I actually interested in? What are my hobbies? Are these hobbies a true indication of my occupational interest?

The candidate's own desires, interests and school achievements are thus of great importance in the planning of an occupation, but he should also consult his parents and relatives, his teachers, the guidance experts of the education departments and others who are competent and qualified to assist him; he should explore the occupational reference library and obtain as much direct information as possible on occupations.

Apart from expert guidance which candidates should already receive at school, the Department of Labour, by means of its Vocational Service Division, is prepared to assist any young person or adult in the choice of a suitable career or field of study. Where great uncertainty exists, psychological tests are applied to determine fields of interest and aptitude. Trained vocational advisers are stationed in all the larger centres in the country. In addition, the Department publishes a quarterly journal, My Career, which is supplied to schools free of charge and in which a large variety of careers are discussed and extensive knowledge of the professional world is supplied. Various other bodies provide information in connection with careers, but then only for their own purposes. The NIPR of the CSIR also undertakes testing and interviewing in cases where vocational guidance is required.

## 5. FINANCIAL ASSISTANCE TO STUDENTS

The systems of training used by colleges for advanced technical education, technical colleges and some other training institutions, offer students the particular opportunity to continue their studies with little or no financial assistance from outside. For example, numerous courses are offered on the sandwich or part-time basis, in which cases the students already receive a salary while their employers, for instance the Public Service, undertake to pay their study fees in full or in part. In other words, financial assistance does not only consist in awarding bursaries and/or grants, but is also available in other forms.

It is therefore mainly persons who are not in employment and who normally study full-time, who may be dependent on financial aid. However, students who produce meritorious work should experience no problems, since the government as well as the private sector makes ample provision for bursaries and/or grants. Moreover, full-time students who work part-time usually earn enough money to pay for their studies.

In the case of some courses the financial assistance available has been indicated. Further information on this and on other forms of assistance, especially by the private sector, is obtainable from the particular training institutions.

Some other schemes of financial assistance are the following:

- The Public Service Bursary Scheme: By means of this scheme, the Government makes provision for financial aid to students according to the needs of each state department. Although bursaries are made available for study in most fields, funds are more readily available for study in those fields where the shortage is greatest. In the selection of candidates academic achievement is

a decisive factor and a candidate whose performance is above average is in a favourable position to obtain a bursary. Students who are awarded bursaries must undertake to enter the Public Service after completion of their studies. Application forms may be obtained from the Public Service Commission or one of the regional offices. The closing date for applications is normally 31 October of every year.

- The National Study Loan and Bursary Fund: The purpose of these bursaries or grants is to assist persons whose achievement at school was not of such a nature that they qualify for other bursaries. Any possible field of study can be taken at any university or college with these bursaries or grants. The fund is administered by the Department of National Education, but applications must be addressed to the particular college.
- Undergraduate study awards for the training of teachers of the four provincial education departments and the Administration of South-West Africa: The awards are intended for any approved teaching-directed course at universities or teacher training colleges. They normally cover tuition and boarding fees and may be repaid by service. Applications are normally handled by heads of high schools, but may also be directed to the director of education of the particular province.
- The Departments of Hospital Services of the four Provincial Administrations have made bursary loans available to students of occupational therapy, pharmacy, physiotherapy, orthopaedics and radiography.
- Student nurses receive a salary while they study. A boarding fee is subtracted from their monthly salary if they reside in the nursing colleges. The South African Nurses' Association administers bursaries for post-basic training.
- Various city councils and town councils have made bursaries available to candidates resident in their areas.

## 6. WOMEN STUDENTS

In the discussion of courses, reference is not always made to women. However, this does not imply that they are excluded. There are few of the fields of study and careers that cannot be successfully followed by women. They are thus encouraged to obtain appropriate training in accordance with their ability, aptitude and interest.

## 7. WHAT IS THIS BOOK ABOUT?

An attempt is made to give an exposition of the wide field of training possibilities after Standard X outside the university and also to provide a brief indication of occupational service or, in other words, job opportunities. As a result of constant changes and development it is, however, practically impossible to lay claim to completeness at any stage. Training is not static and it is, for instance, possible that new courses which were recently established have not been mentioned, while information on some of the others might soon be outdated. The information is on the whole reliable, however, and if there is any uncertainty, it should not be difficult to make direct contact with training institutions, employers and the Department of National Education.

With regard to VOCATIONAL SERVICE, it should be noted that the book is not a commercial publication, with the result that references to individual employers in the private sector had to be restricted to the essential minimum.

In conclusion, prospective students who, after thorough consideration, are still interested in training at a university, are referred to the HSRC publication University training and career possibilities, from which valuable information may be obtained.

Persons who have to leave school without a Standard X Certificate are referred to the HSRC publication Training and career opportunities for school-leavers before Standard Ten.

## CHAPTER II

### TECHNICAL AND RELATED FIELDS

#### A. GENERAL INFORMATION

The training of technicians in the Public Service as well as the private sector which leads to the acquisition of National Diplomas and Certificates, is administered by the Department of National Education. Theoretical training is provided at the colleges for advanced technical education, technical colleges, technical institutes and some correspondence colleges, and candidates receive practical in-service training in the department or private concern where they are employed. Courses in engineering and related fields are offered on the trimester system. (More information on this system will be found in the section on the training of engineering technicians. See p.25.) Other technical courses are offered on the semester system. In this case the training extends over three years of which three semesters will be devoted to theoretical and three to practical training. Provision is also made for training on a part-time basis.

Technicians in the Public Service: With the exception of a few courses, the general admission requirement is a Standard X Certificate or its equivalent with Mathematics and/or at least one science subject. The candidates must also be employed by a Government department in which they receive appropriate training during official working hours.

Class fees of Public Service pupil technicians are paid by the State but pupil technicians have to meet registration and examination fees. Before being accepted for training, pupil technicians undertake to serve the State on completion of their training for a period of at least three years.

Pupil technicians of the Public Service enjoy the status of permanent officials of the Department in which they work and, for instance, receive full salaries and annual increments while they are undergoing training. There are favourable opportunities for promotion for persons whose work is highly satisfactory and who attempt to broaden their knowledge by means of further study. In addition to other benefits, the salary scales provide for the recognition of higher qualifications. A merit system ensures that meritorious work is suitably rewarded.

After successful completion of his training course (i.e. theory and practical), a Pupil Technician is promoted Technician. He then normally proceeds to Senior Technician, Chief Technician and Control Technician.

Some Government departments have their own training systems providing for their specific needs. Some of these are the Departments of Police, Prisons, Transport, Defence, Forestry and the S.A. Railways.

#### B. AGRICULTURE

Remark: The Department of Agricultural Technical Services fulfils an extremely important function in the promotion of agricultural research and guidance in the Republic. The person who feels attracted to an interesting career in a field of agriculture, with the security which the Public Service offers, will definitely be interested in the training scheme, the variety of fields and the opportunity of qualifying, within a short space of time, as a fully fledged technician in the specialized fields of study in which he is interested. The Department pays full salaries as well as class fees during the period of training.

Other Government departments which also have posts for Agricultural Technicians are those of Agricultural Economics and Marketing and Bantu Administration and Development. The latter Department gives preference to persons who have already obtained a Diploma in some agricultural field.

See above paragraph for opportunities for advancement in the Public Service.

Nature and duration of the courses: Candidates receive practical as well as theoretical training in all the options extending over three years, unless stated otherwise, i.e. 18 months' theory and 18 months' practical training, starting from the date on which the pupil is appointed. After his appointment a candidate is admitted to a post at one of the Regional Institutes, Regions or Divisions of the Department, where he will work until the next theoretical course, which must be taken at the Pretoria College for Advanced Technical Education, commences. A National Diploma for Technicians will be issued by the Department of National Education upon successful completion of the whole course.

## 1. AGRICULTURAL EXTENSION

### NATIONAL DIPLOMA FOR TECHNICIANS (AGRICULTURAL EXTENSION)

Admission qualification: A Standard X Certificate or equivalent with Mathematics as a subject. One or more of the subjects Mechanics, Physical Science, Physics, Chemistry, General Science, will be a strong recommendation.

#### Subjects

##### First semester

Soil Conservation T  
Soil Science (Agricultural) T  
Pasture Science T  
Mathematics (Surveyors) I  
Drawing I

##### Second semester

Animal Production T  
Data Collection and the Economics of  
Farm Planning T  
Soil Classification and Land Use T  
Mechanics and Hydraulics T  
Surveying T1

##### Third semester

Extension and Farm Planning T  
Soil Conservation Structures T  
Diverse Structures and Water Utilization T  
Farm Implements T

Technicians undertake the practical administration of the Soil Conservation Act. They visit the farming community, assist with the drawing up of farm plans, etc., evaluate farming conditions in specific areas and provide agricultural extension of a routine nature.

## 2. AGRICULTURAL METEOROLOGY

### NATIONAL DIPLOMA IN AGRICULTURAL METEOROLOGY

Admission qualification: A Standard X Certificate or equivalent with Mathematics as a subject.

Nature and duration of the course: The course extends over three years, i.e. eighteen months of college attendance and eighteen months of appropriate practical in-service training. A statement will be issued to a candidate after he has passed in all the prescribed theoretical subjects and a Diploma after a further 18 months' appropriate practical in-service training.

##### First semester

Soil Science (Agric.) T  
Field Husbandry T  
Horticulture (Agric.) T OR  
Animal Science T  
Insect Control T  
Plant Pathology T  
Statistics T

##### Second semester

Mathematics T (Lab. Techn.)  
Physics T1  
Geography (Meteorology)  
Meteorological Practice T  
Biometry T  
Agricultural Meteorology I

### Third semester

Electronics (Meteorology)  
Climatology I  
Meteorological Instruments I  
Agricultural Meteorology II  
Afrikaans TB OR  
English TB (Second language)

Technicians carry out botanical research, mainly on the influence of specific weather conditions on plants, on the experimental farms of the Department. Research data are processed for the Department for later application in the agricultural sphere.

### 3. AGRICULTURAL MICROBIOLOGY

NATIONAL DIPLOMA IN AGRICULTURAL MICROBIOLOGY

Admission qualification: A Standard X Certificate or equivalent with a science subject.

Nature and duration of the course: The course extends over four years, i.e. four semesters of college attendance and two semesters of appropriate in-service training.

#### First semester

Chemistry T1  
Botany (Agric.) T  
Entomology T  
Agricultural Economics T

#### Second semester

Biochemistry T1 (Theory)  
Biochemistry T1 (Practical)  
Microbiology T1 (Theory)  
Microbiology T1 (Practical)  
Plant Physiology T  
Insect Control T

#### Third semester

Biochemistry T2 (Theory)  
Biochemistry T2 (Practical)  
Microbiology T2 (Theory)  
Microbiology T2 (Practical)  
Histology T (Theory)  
Histology T (Practical)  
Plant Pathology T

#### Fourth semester

Microbiology T3 (Theory)  
Microbiology T3 (Practical)  
Parasitology and Mycology T (Theory)  
Parasitology and Mycology T (Practical)  
Soil Science (Agric.) T  
Horticulture (Agric.) T

Technicians are in the employ of the Department at the veterinary and botanical laboratories where they are concerned with intensive research to protect the country's livestock and vegetation against diseases. Technical assistance on a high level is also indispensable in the preparation and care of media, preparation of vaccines, sprays etc.

### 4. AGRICULTURE

NATIONAL DIPLOMA IN AGRICULTURE

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years, i.e. two years of full-time college attendance and one year of practical in-service training with an approved employer.

#### First semester

Botany (Agric.) T  
Veterinary Anatomy and Physiology T  
Soil Science (Agric.) T  
Farm Implements T  
Agricultural Microbiology T

#### Second semester

Genetics T  
Soil Conservation T  
Land Use T  
Field Husbandry T  
Animal Science T



Third semester

Vegetable Production T  
Poultry Husbandry T OR  
Horticulture (Agric.) T  
Pasture Science T  
Plant Pathology (Agric.) T  
Animal Production T

Fourth semester

Insect Control T  
Animal Pathology T  
Nutrition (Agric.) T  
Extension and Farm Planning T  
Agricultural Economics T

5. AGRICULTURE : INSPECTION SERVICES : BOTANY

NATIONAL DIPLOMA FOR TECHNICIANS (AGRICULTURE : FIELD SERVICES : BOTANY)

Admission qualification: A Standard X Certificate or equivalent.

Subjects

(Plant and Seed Inspection)

First semester

Vegetable Production T  
Insect Control T  
Agricultural Economics T  
Farm Implements T  
Agricultural Microbiology T  
Afrikaans/English TB

Second semester

Field Husbandry T  
Entomology T  
Soil Science (Agricultural) T  
Plant Pathology T  
Horticulture T  
Pasture Science T

Third semester

Programmed course of the Department of  
Agricultural Technical Services

Technicians (Plant inspection) assist with the carrying out of prevention services on a territorial basis, for example inspection of vegetable materials which are being imported or exported, inspection of nurseries, etc. Technicians usually work at ports of import and export and certain airports.

The work of technicians (Seed inspection) which consists in taking care that only seed of high genetic quality is cultivated, entails inspections in connection with the cultivation, harvesting, cleansing, packing, etc. of seed.

6. AGRICULTURE : INSPECTION SERVICES : ZOOLOGY

NATIONAL DIPLOMA FOR TECHNICIANS (AGRICULTURE : FIELD SERVICES : ZOOLOGY)

Admission qualification: A Standard X Certificate or equivalent.

Subjects

(i) Inspectors : Zoological

First semester

Agricultural Economics T  
Agricultural Microbiology T  
Poultry Husbandry T  
Afrikaans OR English TB  
Animal Production T  
Veterinary Anatomy and  
Physiology T

Second semester

Soil Science (Agricultural) T  
Animal Pathology T  
Animal Science T  
Dairying T  
Nutrition T  
Pasture Science T

Third semester

Programmed course of the Department of  
Agricultural Technical Services

(ii) Livestock Improvement

First and second semesters as for Inspectors : Zoology

Third semester

Livestock Industry T  
Livestock Improvement Schemes T (Programmed course)

Technicians make recommendations with regard to the improvement of livestock, supervise the activities of stock inspectors, investigate the state of disease among livestock, collect samples, assist with post-mortem examinations and carry out tests in this connection in laboratories.

7. AGRICULTURE : RESEARCH : BOTANY

NATIONAL DIPLOMA FOR TECHNICIANS (AGRICULTURE : RESEARCH : BOTANY)

Admission qualification: A Standard X Certificate or equivalent with a science subject.

Subjects

First semester

Statistics T  
Laboratory Practice T  
Physics T  
Botany T  
Chemistry T

Second semester

Afrikaans/English TB  
Biochemistry T OR Genetics T  
Biometry T  
Microbiology T OR Genetics T  
Plant Physiology T

Third semester

Field Husbandry T  
Entomology T  
Soil Science (Agricultural) T  
Plant Pathology T  
Horticulture/Pasture Science T

Technicians assist with the planning and cultivation of experimental plots, collecting of experimental data, collecting of insects for experimental purposes, spraying and fumigating experiments, meteorological observations and biometrical and statistical processing of experimental results.

8. AGRICULTURE : RESEARCH : ZOOLOGY

NATIONAL DIPLOMA FOR TECHNICIANS (AGRICULTURE : RESEARCH : ZOOLOGY)

Admission qualification: A Standard X Certificate or equivalent with a science subject.

Subjects

First semester

Zoology T  
Statistics T  
Laboratory Practice T  
Physics T  
Chemistry T

Second semester

Afrikaans/English TB  
Anatomy and Physiology T  
Biochemistry T OR Genetics T  
Biometry T  
Genetics T OR Microbiology T

Third semester

Animal Pathology T  
Animal Science T  
Animal Production T  
Nutrition T  
Pasture Science T

These technicians assist with the supervision and care of livestock, carrying out experiments with regard to animals, processing the results, marking, numbering and weighing of animals, classification of wool, weighing and administering rations to stock in feeding experiments, etc.

9. AGRICULTURE (SOIL SCIENCE)

NATIONAL DIPLOMA IN AGRICULTURE (SOIL SCIENCE)

Admission qualification: A Standard X Certificate or equivalent with a science subject.

Subjects

First semester

Soil Science (Agricultural) T  
Chemistry (Agricultural) T  
Physics (Agricultural) T  
Mathematics (Surveyors) I

Second semester

Soil Science T2  
Land Use T  
Surveying T  
Cartography I  
Photogrammetry I

Third semester

Soil Science T3  
Soil Classification and land use T  
Extension and farm planning T  
Cartography II

10. ANALYTICAL CHEMISTRY

NATIONAL DIPLOMA FOR TECHNICIANS (ANALYTICAL CHEMISTRY)

The course as on p. 40.

Technicians are mainly in charge of chemical analyses in laboratories.

11. DRAUGHTSMANSHIP : CIVIL

NATIONAL DIPLOMA FOR TECHNICIANS (DRAUGHTSMANSHIP : CIVIL)

Admission qualification: A Standard X Certificate or equivalent with Mathematics and one of the subjects Physical Science, Physics, Chemistry or Mechanics.

Subjects

First semester

Mathematics (Surveying) I  
General Science  
Drawing (Surveying) I  
Surveying T1  
Afrikaans OR English TB

Second semester

Mathematics (Surveying) II  
Surveying T2  
Mechanics and Hydraulics  
Civil Engineering Drawing T

Third semester

Strength of Materials (Surveyors)  
Theory of Structures (Surveyors)  
Elementary Civil Engineering

Technicians assist the engineering personnel with surveying, planning of research work in drainage and soil conservation, water utilization and irrigation work.

12. FOOD TECHNOLOGY

NATIONAL DIPLOMA IN FOOD TECHNOLOGY

The course as on p. 14.

For vocational service, see p. 14.

13. HORTICULTURE

NATIONAL DIPLOMA IN HORTICULTURE

The course as on p. 64.

In this case trained technicians also carry out botanical research at the various research stations. Research results are processed with a view to implementation in horticulture.

14. MEAT TECHNOLOGY

NATIONAL DIPLOMA IN MEAT TECHNOLOGY

The course as on p.15.

Officers are mainly responsible for meat inspection services at the various abattoirs.

15. OPERATION OF REFRIGERATION APPARATUS and

16. AGRICULTURAL MECHANICAL ENGINEERING

NATIONAL DIPLOMA FOR TECHNICIANS

Admission qualifications: As for the fields in engineering, p.25.

Nature and duration of the courses: Training for each of these two options extends over four years, i.e. theoretical training of six trimesters and practical training of two years. The subjects for the first three trimesters are the same for both options.

(i) Agricultural Mechanical Engineering

First trimester

Mathematics T1A  
Applied Mechanics T1A(L)  
Engineering Drawing T1A  
Workshop Technology T1A(L)

Second trimester

Principles of Electricity T1A(L)  
Workshop Technology T1  
Mathematics T2B  
Workshop Technology T2B  
General Studies T1A

Third trimester

Applied Mechanics T2B  
Engineering Drawing T2B  
Principles of Electricity T2B(L)  
Workshop Technology T2  
General Studies T2B

Fourth trimester

Mathematics T3C  
Strength of Materials T1C(L)  
Theory of Machines T1C  
Applied Thermodynamics T1C(L)  
General Studies T3C

Fifth trimester

Machine Design T1C  
Hydraulics T1C(L)  
Strength of Materials T2D(L)  
Theory of Machines T2D

Sixth trimester

Applied Thermodynamics T2D(L)  
Machine Design (Theory) T2D  
Hydraulics T2D(L)  
Management TD

(ii) Operation of Refrigeration Apparatus

Fourth trimester

Mathematics T3C  
Strength of Materials T1C(L)  
Electrotechnology T1C(L)  
Refrigeration, Ventilation and Air  
Conditioning T1C  
General Studies T3C

Fifth trimester

Air Conditioning Design T1C  
Hydraulics T1C(L)  
Strength of Materials T2D(L)  
Refrigeration, Ventilation and Air  
Conditioning T2D

Sixth trimester

Refrigeration Design (Theory) TD  
Air Conditioning Design (Theory) T2D  
Hydraulics T2D(L)  
Management TD

These technicians assist with research on farming implements and machinery, tractors or maintenance of refrigeration apparatus.

See also Agricultural Engineering, p.30.

17. SURVEYING : TOPOGRAPHY

NATIONAL DIPLOMA FOR TECHNICIANS (SURVEYING : TOPOGRAPHY)

The course as on p.53.

Technicians mainly do work in connection with soil surveying and drainage problems of proposed irrigation schemes. They also draw up charts on which information regarding the classification and irrigation value of soil is given.

## C. BIOLOGICAL SCIENCES AND RELATED FIELDS

### 1. BIOCHEMISTRY

#### NATIONAL DIPLOMA FOR TECHNICIANS (BIOCHEMISTRY)

Admission qualification: A Standard X Certificate or equivalent with passes in Mathematics and Physical Science or another science subject.

Nature and duration of the course: The course extends over three years and is offered on a part-time or sandwich basis.

#### Part I

Physics T1  
Physical Chemistry T1  
Inorganic Chemistry T1  
Organic Chemistry T1  
Laboratory Practice T  
Analytical Chemistry (Practical) T1  
Analytical Chemistry T1 (Theory)

#### Part II

Organic Chemistry T2  
Inorganic and Physical Chemistry T  
Biochemistry T1  
Microbiology T1

#### Optional subjects

Chemistry T1  
Nuclear Physics and Radio-isotopes  
Languages T A/B

#### Practical

Biochemistry T1  
Microbiology T1

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: Technicians assist biochemists (professional persons) in tasks which are mainly carried out in laboratories. Such laboratories are attached to bodies such as the CSIR; the Medical Research Institute; agricultural and veterinary research institutes; municipal health divisions; the SABS; large hospitals (chemical pathology section); Agricultural Colleges; the Atomic Energy Board; industries responsible for the production of foodstuffs, beer, wines, pharmaceutical remedies, fertilizers, insecticides and weed-killers, cattle remedies and cattle-feed, vitamin concentrates and so forth.

Technicians are also employed by Government departments such as those of Agricultural Technical Services, Health, Agricultural Economics and Marketing, Bantu Administration and Development and some provincial administrations to assist in research on, among others, game, fish, birds, fruit and food technology, wine and wine-making, citrus and subtropical fruit, tobacco, veterinary science, plant protection and horticulture.

### 2. BREWING TECHNOLOGY

#### NATIONAL DIPLOMA IN BREWING TECHNOLOGY

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years on a sandwich basis or 18 months full-time class attendance at the College and 18 months practical experience in an approved brewery.

#### First semester

Chemistry T1  
Physics T1  
Microbiology T1 (Theory and Practical)  
Brewing Technology T1 (Theory)

#### Second semester

Biochemistry T1 (Theory and Practical)  
Brewing Technology T2 (Theory)  
Microbiology T2 (Theory and Practical)  
Tribal Lore and Bantu Beer Legislation T  
Afrikaans T A/B  
English T A/B

### Third Semester

Brewing Technology T3 (Theory)  
Biochemistry (Malting and Brewing) T (Theory)  
Industrial Economics (Bantu Beer Industry) T

#### Training centre

Pretoria College for Advanced Technical Education.

**Bursaries:** The Department of Bantu Administration and Development offers bursaries for the training of suitable candidates. Applications for bursaries should be addressed to the Organizing Committee, Bursaries for Bantu Beer Brewers, P.O. Box 395, Pretoria.

**Vocational service:** Breweries are highly organized nowadays and the most important task of a brewing technologist is to exercise control over the quality and taste of beer. His work involves all aspects from the selection of suitable raw materials to the supply of the final product. The work is highly specialized and the course is consequently orientated on a scientific and practical basis.

Brewing technologists are employed by the Bantu Affairs Administration Boards as well as private and municipal breweries for Whites and Bantu. There are excellent prospects for promotion and salary scales are extremely attractive. A technologist usually starts as a brewing supervisor and can be promoted Brewing Superintendent, Quality Control Superintendent, Production Manager, Manager and even General Manager.

### 3. FOOD TECHNOLOGY

NATIONAL DIPLOMA IN FOOD TECHNOLOGY

**Admission qualification:** A Standard X Certificate or equivalent with a science subject.

**Nature and duration of the course:** The course extends over 18 months (3 semesters) full-time training at a college and 18 months practical in-service training in an approved laboratory or industry. The whole course thus takes three years.

#### Part A

Biology T  
Chemistry T1  
Physics T1  
Microbiology T1 (Theory)  
Microbiology T1 (Practical)  
Afrikaans T A/B  
English T A/B  
Laboratory Organization and Practice T  
(Not an examination subject)

#### Part B

Microbiology T2 (Theory)  
Microbiology T2 (Practical)  
Biochemistry T1 (Theory)  
Biochemistry T1 (Practical)  
Food Technology and Processing T1  
(Theory)  
Food Technology and Processing T1  
(Practical)

#### Part C

Microbiology T3 (Theory)      OR Machine-work T  
Microbiology T3 (Practical)  
Biochemistry T2 (Theory)  
Biochemistry T2 (Practical)  
Food Technology and Processing T2 (Theory)  
Food Technology and Processing T2 (Practical)

#### Training centres

Colleges for Advanced Technical Education.

**Vocational service:** Although the food industry is the largest and most stable industry in the world, it must constantly keep pace with the rapid growth in the world's population. Furthermore, it is one of the industries with the greatest demand for scientists and technologists, since the supply of suitable and healthy food is a necessity for existence. South Africa also urgently needs food scientists and technologists. They play a key rôle in the modern food

industry and are indispensable to the industry of the future and for the development and welfare of the entire country. The many different manufactured food products which are sold today and which save the consumer so much time and trouble as regards their preparation are the achievement of food science.

In some Government departments, the SABS, the CSIR and the various control boards, there is an exceptional demand for properly trained persons to undertake basic and applied research on food, to investigate problems of the industry, to conduct food analysis and to engage in quality control and inspection work in order to ensure that only products of the highest quality are marketed. There are numerous opportunities in industry itself. Fruit and vegetable factories, bakeries, millers, manufacturers of cereals, dairy and canning factories, meat and fish factories, manufacturers of sweets and cold drinks, the manufacturers and distributors of machinery for food factories, packaging material and chemicals for the food industry, et cetera, all require the services of food scientists and technologists and offer them a variety of interesting and challenging opportunities in quality control, product development, manufacturing and production, technical sales and management. The Department of Agricultural Technical Services undertakes research in connection with the preserving of foodstuffs at the Research Institute for Fruit and Food Technology in Stellenbosch, while cold storage studies on citrus and subtropical fruits are carried out at Nelspruit.

#### 4. MEAT TECHNOLOGY

##### NATIONAL DIPLOMA IN MEAT TECHNOLOGY

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over four semesters of college attendance and two semesters of appropriate practical experience at an abattoir approved by the Department of Agricultural Technical Services. (The major subjects are indicated by (x) and (y).)

##### First semester

- (x) Zoology (Agric.) T
- Physics and Chemistry
- (y) Abattoir Planning and Construction T
- Food Animals Management T

##### Second semester

- Food Technology and Processing T1  
(theory only)
- (x) Food Animals Anatomy T1
- Food Animals Physiology T
- (y) Abattoir Microbiology T

##### Third semester

- (x) Food Animals Anatomy T2
- (y) Food Animals Parasitology T
- Nutrition T
- Abattoir Practice T1

##### Fourth semester

- (y) General Pathology T
- Infectious Diseases of Food  
Animals T
- (x) Meat Technology T
- Abattoir Practice T2

##### Training centre

Pretoria College for Advanced Technical Education.

Vocational service: Meat technologists are employed by the Department of Agricultural Technical Services, mainly with a view to meat inspection services at the different abattoirs.

#### 5. MICROBIOLOGY

##### NATIONAL DIPLOMA FOR TECHNICIANS (MICROBIOLOGY)

Admission qualification: A Standard X Certificate or equivalent with a pass in one of the science subjects Biology, Botany etc.

Nature and duration of the course: The course extends over four semesters of college attendance and two semesters of in-service training.

### First semester

Physics T1  
Chemistry T1  
Human Physiology T  
Languages TA/TB - one on the higher level and may be taken in any semester

### Second semester

Biochemistry T1 (Theory and Practical)  
Microbiology T1 (Theory and Practical)  
Histology T (Theory and Practical)

### Third semester

Physiological Chemistry T (Theory and Practical)  
Microbiology T2 (Theory and Practical)  
Haematology T (Theory and Practical)

### Fourth semester

Microbiology T3 (Theory and Practical)  
Virology T (Theory and Practical)  
Parasitology and Mycology T (Theory and Practical)

**Note:** Persons who have successfully completed the examinations for this Diploma, may obtain exemption from the Intermediate Examination for Medical Technologists and may take the Final Examination for Medical Technologists after 2½ years' laboratory experience in an approved laboratory.

### Training centres

Colleges for Advanced Technical Education.

**Vocational service:** Persons in possession of this diploma play an important part in the diagnosis and control of diseases and they are also needed for the biological analysis and control of a variety of products. For this reason the course involves a comprehensive theoretical and practical study of the bacteria which contaminate human beings and animals, as well as of micro-organisms which occur in water, milk, food products, etc.

The services of qualified persons are in great demand in industries, municipalities and research institutions such as the CSIR, SABS and the Medical Research Council, of which various research units and institutes are established in different parts of the country.

Microbiological research is also undertaken by the Department of Agricultural Technical Services the research institutes for Plant Protection, Fruit and Food Technology, Citrus and Subtropical Fruit, Horticulture, Tobacco, Viticulture and Oenology, Veterinary Science, Cattle-breeding and Dairy products, Soil, and other research institutes. Other Government departments which provide work in this field are those of Industries, Agricultural Economics and Marketing, Bantu Administration and Development, Health and Water Affairs. Persons qualified in this field can also obtain employment as laboratory technicians in medical schools and hospitals.

Microbiology is an exceptionally suitable field for women who are interested in the sciences.

See also p. 8 and p. 6 for opportunities for advancement in the Public Service.

## 6. OCEANOGRAPHY

### NATIONAL DIPLOMA FOR TECHNICIANS (OCEANOGRAPHY)

**Admission qualification:** A Standard X Certificate or equivalent with Mathematics and a science subject.

**Nature and duration of the course:** The course extends over three semesters of college attendance and eighteen months of practical training at the Division of Sea Fisheries, Sea Point, Cape Town. Persons interested should in the first place apply to the Branch Sea Fisheries of the Department of Industries, Pretoria, for appointment as Pupil Technicians (Oceanography).

### First semester

Botany (Oceanography) T  
Zoology (Oceanography) T  
Mathematics T  
Afrikaans TB OR English TB  
(Second language)

### Second semester

Chemistry T1  
Physics T1  
Laboratory Organisation and Practice T



### Third semester

Physical Oceanography T  
Chemical Oceanography T  
Biological Oceanography T  
Oceanographic Cartography T  
Fisheries Biology T

### Training centre

Cape College for Advanced Technical Education.

Vocational service: A technician (Oceanography) in the employment of the Division of Sea Fisheries of the Department of Industries spends part of his time in a modern, well-equipped laboratory at the headquarters at Sea Point, Cape Town, or in the laboratories at Luderitz and Walvis Bay. An officer must also periodically spend some time at sea in order to collect data while on board a research vessel. Technicians thus assist oceanographers, namely chemists, physicists and biologists, in the execution of their tasks.

Other institutions and firms which employ oceanographers and marine experts are the following: Institute of Oceanography, University of Cape Town; Oceanographic Research Institute, University of Natal, Durban; Oceanography Division, CSIR, Natal; Natal Regional Laboratory; National Institute for Water Research, CSIR, Natal; Department of Ichthyology, Rhodes University; Department of Zoology, University of the Witwatersrand; Bernard Price Institute for Geophysical Research, University of the Witwatersrand; the South African Museum, Cape Town; South African Naval Hydrographic Office, Simonstown; Naval Oceanographic Research Unit, Youngsfield; Roberts Construction (Land and Marine), Cape Town; The South-West Africa Fisheries Office, Walvis Bay; Fisheries Development Corporation, Cape Town; Collins Submarine Pipelines, Africa (Pty) Ltd, Cape Town; Oceanographic Research Unit, Anglo American Corporation, Johannesburg; Marine Diamond Corporation Ltd (SWA), Cape Town.

There is at present a shortage of trained personnel while the future offers virtually unlimited opportunities for men as well as women who qualify themselves in this field. There are numerous opportunities for advancement for the person who renders satisfactory service and improves his qualifications by further study.

See also p.6 for opportunities for advancement in the Public Service.

## 7. SUGAR TECHNOLOGY

### (i) NATIONAL DIPLOMA IN SUGAR TECHNOLOGY

Admission qualification: A Standard X Certificate or equivalent with passes in Mathematics, Chemistry and Physics (or Physical Science instead of Chemistry and Physics).

Nature and duration of the course: The course is sponsored by the Natal Sugar Millers' Association Ltd, in co-operation with the Sugar Milling Research Institute. It is conducted in English at the Natal College for Advanced Technical Education and commences every second year.

Students are selected by the Sugar Milling Research Institute, Howard College, Durban, and are paid an attractive salary while on the course.

A four-year course is offered as follows:

#### First year

Full-time study at the Natal College for Advanced Technical Education from February to June. The rest of the year is devoted to practical training at a sugar factory.

## Subjects

Factory Control T1  
Inorganic Chemistry T1  
Mathematics (Lab. Tech.) T  
Organic Chemistry T1  
Physical Chemistry T1  
Physics TS1  
Sugar Cane Husbandry T1  
Sugar Technology T1

## Second year

Full-time study at the College during the year.

## Subjects

### First semester

Analytical Chemistry (Theory) T1  
Analytical Chemistry (Practical) T1  
Languages T  
Organic Chemistry TS2  
Physics TS2  
Sugar Cane Husbandry T2  
Sugar Machinery T1

### Second semester

Factory Control T2  
Instrumental Analysis (Practical) T  
Laboratory Organization and Practice T  
Sugar Cane Husbandry T3  
Sugar Machinery T2  
Sugar Technology T2

## Third and fourth years

Practical training at a sugar factory.

### (ii) NATIONAL CERTIFICATE IN SUGAR TECHNOLOGY

This Certificate will be issued after successful completion of the theoretical part for the Diploma and without the practical training.

**Vocational service:** This course offers extensive and purposeful training for persons who are interested in the sugar industry. Practically all aspects of this industry are dealt with and students have the advantage of acquiring knowledge extending from sugar farming to the more sophisticated techniques of laboratory practice. The Natal Sugar Millers' Association is responsible for all training expenses, including registration and examination fees.

## 8. VETERINARY TECHNOLOGY

### NATIONAL DIPLOMA IN VETERINARY TECHNOLOGY

**Admission qualification:** A Standard X Certificate or equivalent with at least one science subject or Mathematics.

**Nature and duration of the course:** The course extends over two years of full-time training at the College followed by one year of appropriate in-service training.

### First semester

Chemistry T1  
Physics T1  
Microbiology T1 (Theory and Practical)  
Animal Anatomy and Animal Physiology T  
(Theory and Practical)

### Second semester

Zootechnology T  
Histology T (Theory and Practical)  
Biochemistry T1 (Theory and Practical)  
Work Studies and Work Methods T

### Third semester

Mycology T  
Virology T (Theory and Practical)  
Bacteriology T (Theory and Practical)  
Veterinary Clinical Pathology T  
(Theory and Practical)

### Fourth semester

Immunology and Serology T (Theory and Practical)  
Protozoology T (Theory and Practical)  
Helminthology T (Theory and Practical)  
Veterinary Entomology T (Theory and Practical)

## Training centre

Pretoria College for Advanced Technical Education.

Vocational service: This course, which was established in 1973, makes provision for a thorough theoretical background and also, apart from the practical in-service training, for exhaustive practical schooling in well-equipped laboratories. Since the college training is first completed, it is only during the practical year that a student need be apprenticed to an approved employer.

Veterinarians are in great demand in veterinary services, which are not limited to the veterinary surgeon in the field but also involve specialized services such as pathology, toxicology, etc., as well as research. They have become indispensable to the veterinary surgeon and the researcher and consequently play an important part in diagnostic services and research, for example at the Research Institute at Onderstepoort, in private practices of veterinary surgeons and in the service of private firms.

## D. D R A U G H T S M A N S H I P

### 1. ARCHITECTURAL DRAUGHTSMANSHIP

NATIONAL CERTIFICATE IN ARCHITECTURAL DRAUGHTSMANSHIP

Admission qualification: As for the fields in engineering, p. 25.

Nature and duration of the course: The course consists of three trimesters of theory (approximately one year) and one year's practical training under the supervision of an architect or civil engineer. The whole course thus takes two years.

#### Part I

Building Construction T1  
 Building Materials T1  
 Draughtsmanship (Building) T1  
 Building Administration and  
 Organization T1

#### Part II

Building Construction T2  
 Building Materials T2  
 Draughtsmanship (Building) T2  
 Drainage and Sanitation T3

#### Part III

Draughtsmanship (Building) T3  
 Quantity Surveying T3 OR  
 Measurement of Building Work T3  
 Building Specifications T3  
 Building Construction T3

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: In the Public Service or in the service of a municipality or private architect, the architectural draughtsman assists the architect in the preparation of drawings for all types of buildings. These draughtsmen are employed by the Government departments of Public Works, Community Development, Bantu Administration and Development, the four provincial administrations and the Administration of South-West Africa.

See also p. 6 for opportunities for advancement in the Public Service.

### 2. CARTOGRAPHY

NATIONAL DIPLOMA FOR TECHNICIANS (DRAUGHTSMANSHIP : CARTOGRAPHY)

Admission qualification: A Standard X Certificate or equivalent with Mathematics and one of the subjects Physical Science, Physics, Chemistry or Mechanics.

Nature and duration of the course: The course extends over three years and is offered on a sandwich basis.

#### First semester

Mathematics (Surveyors) I  
 General Science  
 Drawing I  
 Surveying T1  
 Candidate's Second Language TB

#### Second semester

Geography (Surveyors)  
 Surveying T2  
 Cartography I  
 Photogrammetry I

#### Third semester

Cartography II  
 Cartography III  
 Map Projections

### Training centre

Pretoria College for Advanced Technical Education.

Vocational service: The draughtsman (Cartographic) in the Trigonometry Section of the Department of Agricultural Credit and Land Tenure is concerned with the production of official rural, urban, climatic, marine and air route maps of the Republic.

In the Department of Mines draughtsmen can be employed either in the office of the Government Mining Engineer (Johannesburg) with the task of drawing mining plans, plans in connection with accidents and safety in mines, other plans and diagrams, or in the Geological Survey Division with the task of drawing geological and mineralogical maps for various purposes. Other Government departments in which posts exist are, for example, those of Commerce, Agricultural Technical Services and the Administration of South-West Africa.

See also p. 6 for opportunities for advancement in the Public Service.

### 3. CIVIL

NATIONAL DIPLOMA FOR TECHNICIANS (DRAUGHTSMANSHIP : CIVIL)

Admission qualification: A Standard X Certificate or equivalent with Mathematics and one of the subjects Physical Science, Physics, Chemistry or Mechanics.

Nature and duration of the course: The course extends over three years and is offered on a sandwich basis.

#### First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1

#### Second semester

Mathematics (Surveyors) II  
Surveying T2  
Mechanics and Hydraulics  
Civil Engineering Drawing

#### Third semester

Strength of Materials (Surveyors)  
Theory of Structures (Surveyors)  
Elementary Civil Engineering  
Municipal Administration, Finance and Law

### Training centres

Colleges for Advanced Technical Education.

Vocational service: In the private sector it is the task of the draughtsman (Civil) to draw up the design of a project according to the engineer's specifications in such a way that builders and other artisans will be able to interpret them correctly. Draughtsmen (Civil) are mainly employed by engineering firms and municipalities.

In the Public Service the task of these draughtsmen is about the same. Some of the departments making use of their services are those of Bantu Administration and Development, Public Works, Transport and Water Affairs, as well as the four provincial administrations and the Administration of South-West Africa. Public servants, however, follow a slightly different course. Particulars of this course appear on p. 11.

### 4. HYDROGRAPHY

NATIONAL DIPLOMA FOR TECHNICIANS (DRAUGHTSMANSHIP : HYDROGRAPHY)

Admission qualification: A Standard X Certificate with Mathematics as a subject.

Nature and duration of the course: The course extends over three years, i.e. eighteen months of college attendance and eighteen months of practical in-service training.

First semester

Mathematics (Surveyors) I  
General Science  
Drawing (Surveyors) I  
Surveying T1  
Pen and Ink Drawing Techniques  
(Non-examination subject which can be offered at any stage of the course.)

Second semester

Geography (Surveyors)  
Surveying T2  
Photogrammetry I  
Hydrography I

Third semester

Hydrography II  
Hydrography III  
Map Projections

Training centres

Colleges for Advanced Technical Education.

Vocational service: These draughtsmen are mainly employed by the Government departments of Water Affairs, Forestry and Transport.

5. MECHANICAL AND ELECTRICAL

ENGINEERING DRAUGHTSMEN (MECHANICAL AND ELECTRICAL)

Candidates who are interested in this field are referred to the provisions for training in engineering p.25.

The following subject components are recommended by the Department of National Education for the Certificate courses in Engineering Draughtsmanship (Mechanical and Electrical):

First trimester

Applied Mechanics T1  
Mathematics T1  
Engineering Drawing T1  
Applied Technology (Draughtsmen) T1

Second trimester

Engineering Drawing Practice T2  
Applied Mechanics T2  
Engineering Drawing T2  
Applied Technology (Draughtsmen) T2

Third trimester

Mechanical

Engineering Drawing Practice T3  
Applied Technology (Draughtsmen)  
Mechanical T3  
Strength of Materials T3  
Machine Design T3 OR  
Automotive Design T3

Electrical

Engineering Drawing Practice T3  
Applied Technology (Draughtsmen)  
Electrical T3  
Strength of Materials T3  
Electrical Design (Draughtsmen) T3

6. STRUCTURAL

Candidates who are interested in DRAUGHTSMANSHIP : STRUCTURAL are referred to the provisions for training in engineering, p. 25.

7. TOWN AND REGIONAL PLANNING

NATIONAL DIPLOMA FOR TECHNICIANS (TOWN AND REGIONAL PLANNING)

Admission qualification: A Standard X Certificate or equivalent with a pass in Mathematics.

Nature and duration of the course: The course extends over four years and is offered on a sandwich basis.

First semester

Mathematics (Surveyors) I  
General Science  
Drawing (Surveyors) I  
Surveying T1  
Pen and Ink Drawing Techniques  
(Non-examination subject which can be offered at any stage of the course.)

Second semester

Geography (Surveyors)  
Surveying T2  
Photogrammetry I  
Hydrography I

Third semester

Hydrography II  
Hydrography III  
Map Projections

Training centres

Colleges for Advanced Technical Education.

Vocational service: These draughtsmen are mainly employed by the Government departments of Water Affairs, Forestry and Transport.

5. MECHANICAL AND ELECTRICAL

ENGINEERING DRAUGHTSMEN (MECHANICAL AND ELECTRICAL)

Candidates who are interested in this field are referred to the provisions for training in engineering p.25.

The following subject components are recommended by the Department of National Education for the Certificate courses in Engineering Draughtsmanship (Mechanical and Electrical):

First trimester

Applied Mechanics T1  
Mathematics T1  
Engineering Drawing T1  
Applied Technology (Draughtsmen) T1

Second trimester

Engineering Drawing Practice T2  
Applied Mechanics T2  
Engineering Drawing T2  
Applied Technology (Draughtsmen) T2

Third trimester

Mechanical

Engineering Drawing Practice T3  
Applied Technology (Draughtsmen)  
Mechanical T3  
Strength of Materials T3  
Machine Design T3 OR  
Automotive Design T3

Electrical

Engineering Drawing Practice T3  
Applied Technology (Draughtsmen)  
Electrical T3  
Strength of Materials T3  
Electrical Design (Draughtsmen) T3

6. STRUCTURAL

Candidates who are interested in DRAUGHTSMANSHIP : STRUCTURAL are referred to the provisions for training in engineering, p. 25.

7. TOWN AND REGIONAL PLANNING

NATIONAL DIPLOMA FOR TECHNICIANS (TOWN AND REGIONAL PLANNING)

Admission qualification: A Standard X Certificate or equivalent with a pass in Mathematics.

Nature and duration of the course: The course extends over four years and is offered on a sandwich basis.

### First year

Mathematics T1  
Drawing 1  
Surveying T1  
English A/B T  
Afrikaans A/B T

### Third year

Photo Interpretation T  
Applied Statistics T  
History and Principles of Planning T  
Drawing and Design T2

### Second year

Photogrammetry I  
Cartography I  
Elementary Principles of Civil  
Engineering T  
Drawing and Design T1

### Fourth year

Law and Administration T  
Planning, Survey and Analysis T  
Socio-Economic Organization T  
Drawing and Design T3

### Training centres

Colleges for Advanced Technical Education.

**Vocational service:** The draughtsman (City Planner) must have first-hand knowledge of town and regional planning in general in order to carry out his duties effectively. The work consists in the compiling of maps, graphs, diagrams and sketches as well as the construction of models for the elucidation of town and regional planning schemes. Use must be made of ultra-modern techniques.

Draughtsmen are usually employed by private firms which undertake town and regional planning, architects, municipalities of large towns or cities, etc. In the Public Service there are posts for draughtsmen in the Departments of Bantu Administration and Development, Planning and the Environment, Community Development, as well as in the provincial administrations of the four provinces. The ranks to which draughtsmen can progress in the Public Service are: Pupil Draughtsman, Draughtsman, Senior Draughtsman, Chief Draughtsman and Control Draughtsman.

See also p.6 for opportunities for promotion in the Public Service.

## E. ENGINEERING

### 1. GENERAL INFORMATION

#### The technician

It is virtually impossible to give a correct definition of the occupational fields of the technician and artisan (Apprentice) and to touch on all related aspects and branches. With this in view and in order to provide a significant picture of the place and function of the technician, the artisan and the professional engineer in South African industry and to indicate where the training of technicians leads to, each of the fields is analysed very briefly.

**Engineer:** The position of the engineer is well known to us. He is a professionally qualified person who is in possession of an appropriate B.Sc. (or higher) degree, or of other qualifications which the SACPE recognizes for purposes of registration. He plays an important and creative part in the community by the processing of scientific facts and the utilization of his knowledge for application in practice. The engineer usually works from a position of authority, and delegates practical duties to technicians, artisans and other workers.

**Artisan:** An artisan is qualified to undertake practical tasks at the level of artisanship. The status of artisan is preceded by the completion of a period of apprenticeship of a few years. The apprentice learns all aspects of his trade by means of practical experience and under the supervision of skilled artisans. He is also compelled to attend theoretical courses at technical colleges or institutes. After this he works, for example, with machines designed by the engineer and mounted by the technician.

**Technician:** Industrial development, a shortage of engineers and the intricacy of engineering projects are some of the factors which contribute to making it necessary that the engineer should be released from certain routine and practical tasks so that he can devote most of his time and energy to planning and creative work. The

artisan's training usually precludes him from carrying out these tasks so that there must be someone, the technician, whose training is such that he can serve as a link between the artisan and the engineer or scientist in the normal course of events. Whereas the engineer is regarded as the person with the necessary knowledge of calculation, design, etc., the technician is the person who, with his academic training, must be qualified to interpret how the calculations and designs are done so that he, as a result of his practical training, can make them himself or explain them to the artisan so that the latter can carry out the task without difficulty. The technician is thus, on the strength of his function of supervision and control, the right hand and eye of the engineer. However, it is important to remember that in certain industries the technician is totally dependent on himself as a result of the nature of the industry and must consequently fulfil his function without the co-operation of an engineer.

The nature of a technician's work is such that he must be highly trained, with sound judgment and the ability to assume responsibility and carry out important tasks efficiently as co-worker with the engineer or other scientist. The qualifications which can be obtained are the National Certificate for Technicians, the National Higher Certificate for Technicians and the National Diploma for Technicians which are usually offered on a sandwich basis by the colleges for advanced technical education and a few technical colleges. The qualified person (after 3 - 4 years' training) is then officially known as a "technician", while a graduate is known as a "professional officer".

The remuneration received by an able technician is approximately equal to that of someone with three years' training at a university and the technician has the additional advantage, among other things, of being able to study at his employer's expense while he earns a salary. The demand for technicians is at present much greater than the supply. A suitable candidate cannot go wrong by applying for one of the many available courses for technicians.

There are numerous job opportunities for persons with technical qualifications in large industries such as Escom, Iscor, Sasol, the South African Railways, the Atomic Energy Board, the CSIR, the army, air force and navy of the S.A. Defence Force, the motor industry and many other larger or smaller industries. The opportunities for candidates who are willing to work and constantly to improve their qualifications are practically unlimited and they can continue their studies and improve their qualifications while working and earning, mainly at the expense of their employers. According to authoritative calculations, there should, for instance, be three qualified technicians for every engineer or scientist. At present the figure is slightly more than one.

#### Training at secondary school level (Apprentices)

Although the purpose of this book is to give information on training at tertiary level, excluding university training, it is nevertheless considered desirable to provide a brief indication of the training available for artisans (apprentices) and, in so doing, to establish a coherent picture of the training for technicians in general.

**Admission:** After a candidate has obtained either a Std 7, a Std 8 or an equivalent certificate according to the requirements of the artisan field in which he wishes to qualify, and he is not required by law to attend school, he may be registered as an apprentice in a designated trade with an employer in any of the industries concerned, provided the employer is able to provide suitable training. Prospective apprentices must, however, bear in mind that the above-mentioned are only the general minimum requirements and that some employers insist on higher educational qualifications, for example a Std 9 or even a Std 10 Certificate for a specific artisan field. Exemption with regard to age and educational qualifications may be granted in meritorious case by the Registrar of Apprentices on the recommendation of the apprenticeship committee concerned.

Apart from that candidates may present themselves for an aptitude test which may be conducted by the Department of Labour in any of its urban offices in Cape Town, Port Elizabeth, East London, Durban, Pretoria, Johannesburg, Kimberley, Bloemfontein and Windhoek. Should the number of candidates justify it, the Department may send out officials to central test centres in the country to conduct the test and to advise candidates. On the strength of this test it can be determined which artisan



field is the most suitable for a particular candidate.

Training and further training: In the RSA the training of apprentices is undertaken by various government concerns and quite a number of larger and smaller industries. These industries, of which some provide training in more than forty artisan fields, collaborate closely for this purpose with the Department of Labour. The training of apprentices is furthermore subject to the Apprenticeship Act, Act No. 37 of 1944, which is administered by the Department of Labour in co-operation with the Department of National Education. Technical colleges and technical institutes offer theoretical tuition for the acquisition of various Technical Certificates and Diplomas. The attendance of these classes by apprentices takes place as far as possible through the group training scheme (block-release) which usually comprises full-time attendance over a period of approximately eleven weeks annually and which may be followed, if necessary, by part-time classes to be attended after working hours. In some cases correspondence courses for apprentices are offered by the Division External Studies (Correspondence Courses) of the Witwatersrand College for Advanced Technical Education.

The period of apprenticeship depends on what is prescribed for the industry and trade concerned and may vary from  $2\frac{1}{2}$  years to 5 years. The period for most popular trades is usually four years. Artisan status may be obtained either after the apprenticeship has elapsed or by passing a voluntary or compulsory trade test at an earlier stage. The Registrar may, however, grant remission from the contract period on the strength of appropriate experience gained prior to entering into a contract. Compulsory and voluntary trade tests are conducted by the Department of National Education in conjunction with the Department of Labour at the Central Organisation for Trade Testing at Olifantsfontein.

It is possible for an artisan to continue studying and, for example, advance to the status of a technician. Candidates in possession of the National Technical Certificate Part III or a Standard 10 Certificate or equivalent may continue to work while studying at colleges for advanced technical education, some technical colleges and a few technical institutes, where they can first obtain the National Certificate for Technicians, followed by the National Higher Certificate for Technicians.

According to the regulations of the Department of National Education, a Certificate student who obtains 50% in all his subjects may change over to the course for the National Diploma for Technicians and supplement the missing subjects plus laboratory work and the subject General Studies. In order to obtain the Diploma the candidate must pass in six T1, six T2, six T3 and six T4 subjects, in addition to practical training.

Nowadays many technicians have an artisan background and the artisans also form an important source for supplying at least two technician groups. For example, 33,5 per cent of engineering technicians and 33,3 per cent of draughtsmen technicians are qualified artisans. In practice, especially in the private sector where there is a system of upgrading, many artisans are used on the technical level without any further formal training.

Artisan training and technician training often go hand in hand. A technician student in radio engineering, for example, qualifies for the National Diploma for Technicians after two years of theoretical training at a college for advanced technical education and two years' practical training. After the two years of theoretical training he may enter into a contract of apprenticeship and be granted exemption for the time when he studied full-time. Consequently he may obtain the NDT and artisan status simultaneously.

Industries and Industrial Councils: The industries mentioned here have applied through the agency of their Industrial Councils to the Department of Labour for Apprenticeship Committees. These committees function under the supervision of the Department and there is consequently close liaison between the Department and the Industrial Council of the industry concerned. It is thus recommended that candidates contact the Industrial Council of the industry under which the artisan field in which they are interested falls. This will then give them an indication of the concerns which have vacancies for apprentices.

The industries are the following:  
Aerospace industry, Building industry, Coal mining industry, Diamond cutting industry, Electricity supply industry, Explosives and allied industries, Furniture industry,

Government undertakings, Grain milling industry, Hairdressing industry, Jewellers' and Goldsmiths' industry, Metal industry, Mining industry, Motor industry, Printing industry, SA Railways, Sugar manufacturing and refining industry.

## 2. TRAINING OF ENGINEERING TECHNICIANS

### Training system

The training system for engineering technicians is that of sandwich courses based on trimesters. This means that approximately four months of college attendance is alternated with four months' practical in-service training. The system applies in the case of the certificate courses as well as the diploma courses.

Admission qualifications: The general admission qualification for the Certificate and Diploma courses is a Standard X Certificate or equivalent.

In the case of courses for which specific subjects are required, for example Mathematics or a science subject or both, heads of colleges may admit students whose knowledge of the required subject(s) falls short, to a preparatory class so that they may bring their knowledge up to the required level before they register for the course. Similar steps may be taken in the case of immigrants or persons who hold N3 or equivalent qualifications.

### Certificates and diplomas

Remark: These certificate and diploma courses are intended for persons who aspire to posts in the Government and the industrial sectors for which education and training are necessary in the technical field on the tertiary level. The certificate course is mainly intended for advanced apprentices and does not include the subject General Studies (formerly Languages) nor laboratory training where applicable.

#### (1) The National Certificate for Technicians

##### (a) Candidates must

- be registered as students at a college for a period of at least three trimesters (or its equivalent in the case of full-time, part-time or correspondence courses), and must have passed in not fewer than 4 T1, 4 T2 and 4 T3 subjects (altogether 12 subject components)
- submit to the Department acceptable documentary proof of at least two years' appropriate practical in-service training.

##### (b) Training centres: All the Colleges for Advanced Technical Education, certain Technical Colleges, certain Technical Institutes and certain Correspondence Colleges.

#### (2) National Higher Certificate for Technicians

##### (a) Candidates must

- comply with the requirements for the award of the National Certificate for Technicians
- be registered for at least one additional trimester or its equivalent
- pass in the National examinations in four prescribed T4 subjects (altogether 16 subject components).

##### (b) Training centres: As for the National Certificate for Technicians.

#### (3) National Diploma for Technicians

##### (a) Candidates must

- be registered at a college for advanced technical education for a period of at least six trimesters, or its equivalent, and must have passed in at least 6 T1, 6 T2, 6 T3 and 6 T4 subjects (altogether 24 subject components)
- submit to the Department acceptable documentary proof of at least two years' appropriate in-service training. Candidates who have already given satisfactory proof of in-service training towards obtaining the National Certificate for Technicians need not submit any further proof.

##### (b) Training centres: Colleges for Advanced Technical Education only.

(c) Remark: The compulsory subject General Studies takes the place of Languages for the diploma course.

(4) Intermediate Diploma for Technicians

(a) The Intermediate Diploma will be awarded on completion of the first half of the requirements for the full Diploma, namely college attendance of three trimesters during which the prescribed T1 and T2 subjects and one year's appropriate in-service training have been completed.

(This Diploma is based on internal examinations and will accordingly be awarded by the colleges and not by the Department.)

(b) Training centres: Colleges for Advanced Technical Education only.

(5) National Higher Diploma for Technicians

Particulars of this Diploma will be announced by the Department of National Education at a later date. Meantime the existing courses and syllabi will be continued. See p. 29.

Pass requirements: A pass mark of 40% in each subject is required for the award of a certificate and 50% in each subject in the case of a diploma.

Change-over

(a) Certificate to Diploma: A Certificate student who obtained 50% in all his subjects, may change over to the Diploma course and supplement the missing subjects and the laboratory work.

(b) Diploma to Certificate: A Certificate may be issued to a Diploma student who did not reach the 50% level, but who has satisfied the requirements for the Certificate.

Single-subject candidates

Students who are interested in a study of, and attending classes in, only one or two subjects of a particular course, without intending to acquire a National Certificate or Diploma, may readily be admitted to such classes, provided they comply with the admission requirements laid down, or possess the requisite basic knowledge. These students may write the National examinations, where applicable, in such subjects, and, if they pass, receive a statement of subject successes on request. Should such a student comply with all the requirements he may eventually obtain a complete certificate or diploma.

Fields for engineering technicians

Aeronautical Radio; Agricultural Mechanisation; Aircraft Engineering; Armament Engineering; Automotive Engineering; Civil Engineering; Draughtsmanship : Mechanical Engineering; Draughtsmanship : Structural; Electrical Engineering; Electronic Engineering; Instrumentation and Control; Instrumentation and Development; Instrumentation : Defence (S.A. Air Force); Instrumentation : Defence (S.A. Defence Force); Marine Engineering; Mechanical Engineering; Production Engineering; Radio Engineering; Railway Signal Engineering; Space Communication.

N.B.: Diplomas and certificates obtained in these options will be issued without stating the specific option. The diploma or certificate which, for example, has been obtained in the option Civil Engineering, will read: NATIONAL DIPLOMA FOR TECHNICIANS or NATIONAL CERTIFICATE FOR TECHNICIANS or NATIONAL HIGHER CERTIFICATE FOR TECHNICIANS, etc.

Structure of the course and list of subjects

Courses which must comply with the minimum requirements to obtain the certificates and diplomas concerned are compiled in conjunction with the student, the employer and the educational institution concerned. The choice of subject components for the structure of the course thus depends on the requirements of the employer and/or the interests of the student and the facilities offered by the educational institution. Subjects are chosen from the list of subjects given below, with due allowance for the foreknowledge necessary for choosing subjects on higher levels, to form a coherent whole. In general the field of study or orientation of course composition is indicated by the subjects selected.

The attention of candidates is drawn to the fact that the list of subjects is being amended continuously. The latest list is obtainable from the Department of National Education.

## Subjects

Mechanical, Electrical (h.c. and l.c.) Civil, Structural, Building and Telecommunication:

- + = May also be taken for the higher grade
- L = Subject must include laboratory practice for diploma students
- F = Subject must include field work for diploma students
- P = Only a telecommunication subject
- PE = Common to telecommunication and other courses
- h.c. = Heavy current
- l.c. = Light current
- M = Mechanical (mechanical field of study)
- M and E = Mechanical and Electrotechnical (heavy current)
- M and l.c. = Mechanical and Electrotechnical (light current)
- E = Electrotechnical (electrotechnical field of study)
- B = Subject to be examined externally

Advanced Electrical Engineering T5	Building Specifications T3 +
Aerodynamics T3, T4 L	Carrier Systems T2 P
Aero Engine Design T3, T4	Carrier Systems (Cable) T3
Air Conditioning Design T4	Carrier Systems (Open Wire) T2
Aircraft Design T3, T4	Chemistry (General) T2 L
Applied Mechanics T1, T2 L/PE	Civil Engineering Drawing T2
Applied Mechanics (Building) T1	Civil Engineering Materials T2
Applied Statistics T4	Civil Engineering Quantities, Specifications and Estimating T4
Applied Technology (h.c.) T1, T2, T3	Cloth Finishing and Making Up T2
Applied Technology (l.c.) T1, T2	Cloth Structure and Design (Knitting) T3
Applied Technology (M) T1, T2, T3	Cloth Structure and Design (Spinning) T3
Applied Technology (Draughtsmen) T1, T2	Cloth Structure, Analysis and Design (Weaving) T3
Applied Technology (Draughtsmen) Electrical T3	Communication Electronics, T2, T3 L
Applied Technology (Draughtsmen) Mechanical T3	Computer Basics T1, T2 L
Applied Technology (Marine) T3, T4	Computer Technology T3, T4 L
Applied Thermodynamics T3, T4 L/PE	Construction Management T4
Applied Thermodynamics T5	Costing and Estimating T3
Arc Welding Processes T3 L/+	Costing and Valuations T3
Audio Engineering T4	Digital Techniques T3, T4 L
Automatic Control T3, T4	Drainage and Sanitation T3
Automatic Exchanges (British) T2, T3 P	Draughtsmanship (Building) T1, T2, T3
Automatic Exchanges (German) T2, T3 P	Drawing Office Practice, T2, T3 P
Automatic Switching (British) T2 P	Electrical Design (Draughtsman) T3
Automatic Switching (German) T2 P	Electrical Engineering T3, T4 L
Automotive Design T3, T4	Electrical Machines T3, T4 L
Basic Telecommunications T1 L/PE	Electrical Measurements T3, T4 L
Building Administration and Organization T1, T2, T3	Electrical Measurements (Telecom.) T4 L/P
Building and Civil Engineering Construction T2, T3 +	Electrical Power and Control T1, T2, T3, T4
Building Calculations T1, T2	Electrical Power and Control (Practical) T1, T2, T3, T4
Building Construction T1, T2, T3	Electronic Measurements T3, T4 L
Building Construction BT2	Electronics T2, T3 L
Building Inspection, Regulations and Administration T1	
Building Materials T1, T2, T3	
Building Materials BT2	
Building Plans: Interpretation, Control and Valuation BT2	
Building Construction T4	

Electrotechnique (Civil) T1  
 Electrotechnology (M. & I.c.) T3 L/PE/+  
 Engineering Drawing T1, T2 PE  
 Engineering Drawing Practice T2, T3  
 Engineering Graphics T3 PE  
 Engineering Science T1 +  
 Equipment Overhaul T3 P  
 Estimating and Pricing (Building) T3, T4  
 Estimating and Pricing (Additional) T4  
  
 Financial Planning and Cost Control T4  
  
 General Studies T1, T2, T3 PE  
 Geology T2  
  
 Hydraulic Control Systems T3, T4 L  
 Hydraulics T3, T4 L/PE  
 Hydraulics T5  
 Hydrology T3, T4  
  
 Industrial Electronics T4 L  
 Industrial Instruments T2, T3, T4 L  
 Internal Combustion Engines T3, T4 L  
  
 Jig and Tool Design T3, T4  
  
 Knitwear Manufacture T3  
  
 Line Plant T4 L/P  
 Lines T2, T3 P  
 Line Transmission T2, T3, T4 L/P  
 Logic Techniques T2 L/PE  
 Logic Techniques T3 L/P  
  
 Machine Design T3, T4 PE  
 Machining T2, T3 P  
 Main Drainage of Towns T4  
 Management T4  
 Marine Engineering T3, T4  
 Marine Engineering: Drawing T3  
 Marine Engineering: Knowledge T4  
 Materials Science T3, T4  
 Mathematics T1, T2, T3 PE  
 Mathematics T4, T5  
 Measurement of Building Work T3  
 Mechanical Aids T2, T3 P  
 Mechanical Technology (E) T3 +  
 Mechanics of Machines T3, T4 PE  
 Metrology T4  
 Microwave Techniques T3, T4 L  
 Microwave Transmission T2, T3 P  
  
 Naval Architecture T3, T4 L/PE  
 Networks T3 P  
  
 Physics B T1, T2  
 Principles of Electricity T1, T2 L/PE  
 Principles of Electricity (Telecom.) T1  
 Principles of Knitting T2, T3  
  
 Principles of Spinning T2, T3  
 Principles of Weaving T2, T3  
 Private Automatic Branch Exchanges T3 P  
 Processes related to Spinning T3  
 Production, Planning and Control T3, T4  
  
 Quantity Surveying T3, T4  
 Quantity Surveying (additional) T4  
  
 Radar Theory T3, T4  
 Radio Communication T4, T5  
 Radio Communication (Telecom.) T2, T3 L/P  
 Radio Receivers T3 P  
 Radio Systems T2, T3 P  
 Radio Transmission T2 P  
 Radio Transmitters T3 P  
 Railway Signal Engineering T3, T4  
 Refrigeration Design T4  
 Refrigeration, Ventilation and Air Conditioning T3, T4  
 Road Construction and Design T4  
  
 Science for Builders T1, T2, T3  
 Soil Mechanics T3 L  
 Space Physics T4  
 Strength of Materials T3, T4 L/PE  
 Strength of Materials T5  
 Structural Design T3, T4  
 Subscriber's Plant T2, T3 P  
 Surveying T2, T3 F/+  
  
 Telecommunication Principles T1, T2 L/P  
 Telecommunication Science T1 P  
 Telegraph Communication Systems T3 P  
 Telegraph Exchanges T2, T3 P  
 Telegraph Machines T2, T3 P  
 Telegraph Mechanisms T2 P  
 Telegraph Transmission T2 P  
 Telegraphy T2, T3, T4 L/P  
 Telephony T2, T3, T4 L/P  
 Television T3, T4  
 Theory of Machines T5  
 Theory of Machine Tools T3, T4  
 Theory of Structures T3, T4  
 Theory of Structures (M) T4  
 Textile Electronics T2  
 Textile Factory Management T3  
 Textile Materials and Processes T1  
 Textile Testing, Calculations and Statistics T2  
 Toolmaking T2 P  
 Trunk Line Transmissions T2 P  
  
 Utilization of Electronic Plant T5  
  
 Vacuum Technology T3, T4  
 Video Transmission T4 L/P  
  
 Welding Design T3 L  
 Welding Design T4  
 Welding Equipment T3 L

Welding Metallurgy T3 L/+  
Welding Processes T4 L  
Welding Production T3 L  
Welding Production T4  
Welding Quality Control and Inspection  
T3 L/+

Welding (Telecom.) T2 P  
Workshop Technology (l.c.) T1, T2 L/PE  
Workshop Technology (l.c.) T3 L  
Workshop Technology (M & E) T1, T2 L  
Workshop Technology (M) T3 L  
Work Study T3, T4

#### NATIONAL HIGHER DIPLOMA FOR TECHNICIANS

Admission qualification: This course can be taken in an appropriate branch after the National Diploma for Technicians has been obtained.

Duration of the course: There is no definite period for completing the course. This course provides for the following three options:

(i) Electrical Engineering

Subjects

Mathematics (Higher Diploma)  
Advanced Electrical Engineering  
Utilization of Electrical Plant

(ii) Mechanical Engineering

Subjects

Theory of Machines T3  
Hydraulics T3  
Strength of Materials T3  
Applied Thermodynamics T3

(iii) Radio Engineering

Subjects

Mathematics (Higher Diploma)  
Advanced Electrical Engineering  
Radio Communication (Higher Diploma)

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: The courses in engineering which lead to the National Certificate for Technicians, The National Higher Certificate for Technicians and the National Diploma for Technicians make provision for the training of candidates who do not comply with the university entrance requirements or who cannot or do not wish to go to university. On completion of, for example, the diploma course of four years, the engineering technician is, however, extremely well versed in the practical principles, in particular, of his occupation. Although his course is not the equivalent of that of the professional engineer and he is consequently not an engineer, the technician is a highly qualified person, purposefully trained at tertiary level and able, at his individual level, to do work which is just as important and useful as that performed by an engineer.

Since the various branches of the engineering profession also indicate the sphere of employment of the technician, a few of the many fields are briefly indicated by means of examples. Although an engineer normally specializes in one field or function, the work, which is closely related in many fields, can sometimes demand of him a function which lies beyond the scope of his particular field. The usual functions which can be distinguished in each section are, for example, research, design and development, construction and installation, industrial supervision and maintenance, marketing and sales and management. Technicians have the advantage of arranging their courses in such a way that they will be able to serve in more than one function.

Electrical Engineering: The field of the electrical engineer and technician is divided into two sections, viz that of power and that of electronics. The first includes the design, manufacture and/or maintenance and control of electric generating plants, transformers and switchgear, electric motors, power cables, long-distance high voltage transmission lines, electric locomotives and electric machinery of all kinds. Electronics covers the field of "light current" apparatus using valves, transistors, relays and cathode-ray tubes and embraces telecommunications engineering, including automatic exchanges, multiple-channel transmission by carrier and micro-wave, radio, television and navigational aids such as radar, sound-track reproduction and many other electronic aids for use in industry and scientific research.

Bodies which make use of the services of these engineers and technicians are the Railways, Escom, Iscor, municipalities, Posts and Telegraphs, industries, factories, the radio industry, private concerns, the SABS, mines and so forth. Various Government departments make use of electronic engineers and technicians. These Departments are those of Public Works, Agricultural Technical Services, Transport, Bantu Administration and Development, Mines, Community Development, Labour, and the administrations of the provinces and South-West Africa.

Agricultural Engineering: In the modern agricultural industry the engineer is responsible for agricultural machinery; engineering aspects of soil conservation; planning, design, construction and maintenance of equipment; design of farm construction; matters pertaining to irrigation and drainage, etc.

The major employers in this sphere are, for example, the Government departments of Agricultural Technical Services, Bantu Administration and Development, Water Affairs, Public Works and the Administrations of the provinces and South-West Africa; various agricultural co-operatives; the sections of commerce and industry which are concerned with agricultural products and the manufacture of agricultural implements.

Mechanical Engineering: This field of study includes the design, construction, marketing, installation and maintenance of mechanical equipment, such as machine tools, equipment for handling material, automatic production line machinery for factories, mining plants, road and agricultural machinery, refrigeration and air conditioning plants, boilers, pumps, air compressors, turbines, oil and gas engines, automobiles, aircraft, ships and railway locomotives. The work is to a large extent of an intellectual nature and is complex, varying and never merely a matter of routine. It demands a capacity for thinking and judgment and for guiding and controlling others in respect of their technical and administrative tasks. The mechanical engineer renders a particular service to the community which can justly be considered as the corner-stone of modern technology. The processing, handling and distribution of a product is directly dependent upon the application of the principles of mechanical engineering science.

Some of the most favourable job opportunities for engineers and technicians are found in such organizations as the Railways, factories and other large industrial concerns such as the mines, Iscor, Sasol and so forth; the CSIR; the AEB; aviation and marine companies and large municipalities. The Public Service offers extremely attractive careers in this field in the Departments of Public Works, Bantu Administration and Development, Defence, Agricultural Technical Services, Labour, Mines, Water Affairs, Transport and the administrations of the four provinces and South-West Africa.

Civil Engineering: These engineers, who constitute the largest group in the country, are concerned with the planning, design, building and maintenance of projects to control and regulate man's physical environment to his advantage.

In practice, for example in the Public Service, these engineers and technicians are responsible for the planning, design and building of roads, bridges, airports, public buildings, storage dams, irrigation schemes, water supply schemes, soil conservation works, sewerage systems, etc. The work has many specialized subsections and the greatest variety of job opportunities is found in the Government departments of Water Affairs, Public Works, Agricultural Technical Services, Bantu Administration and Development, Transport, Community Development and the administrations of the four provinces and South-West Africa. Civil engineers and technicians are also employed by such organizations as the Railways, municipalities, the CSIR, construction companies and other private concerns.

#### The South African Association of Consulting Engineers

Consulting engineers play an extremely important rôle as employers of civil engineers, in particular, but also of other engineers. The importance of a private consulting practice is also stressed.

The South African Association of Consulting Engineers, for instance at present employs more than 1 000 professional engineers and almost 2 000 engineering aides and technicians in the field of civil engineering and approximately 400 and 600 respectively in the fields of electrical, mechanical, heating and ventilation engineering. In addition, some 600 engineers are principals of or partners

in such consulting engineering firms. Private professional practice thus offers considerable opportunity for engineers and technicians.

Professional Engineering Institutes: A qualified technician can also further his studies, write the examinations of the professional institutes and, in so doing, equip himself still better in his particular field. The conditions on which membership of the various professional institutes in the different fields of engineering is granted, can be obtained from the Secretary of the Federation of Societies of Professional Engineers, P.O. Box 61019, Marshalltown 2107.

### 3. TELEVISION

Regulations for training: The regulations concerning admission requirements, training and qualifications to be obtained, as set out above for engineering technicians, also apply to those interested in television. All the colleges for advanced technical education as well as some technical colleges may compose courses containing such subject components as may be required for training in television. Prospective students are, however, advised first of all to get into touch with an employer such as the SABC or manufacturers and distributors of television sets with a view to employment and practical in-service training. The employer, will, in consultation with the student and a training institution, determine the theoretical content of the course.

Vocational service: South Africa has recently entered the era of television, a service in which millions of rand have already been and will still be invested. Great numbers of trained persons such as engineers and technicians will therefore be needed to enable the service to function efficiently and to protect investments. Opportunities for competent technicians prepared to work hard and keep on studying are practically unlimited.

Examples of fields which will need the services of technicians are the following:

The manufacturing sector: This field probably offers the greatest number of opportunities, since this industry will have to develop spectacularly in order to satisfy the new requirements. The activities in connection with manufacturing can be classified under research, development, design, testing, production and technical salesmanship. However, the basic principles of television are a prerequisite for success in any of the above-mentioned fields.

Operational sector: This includes, for example, the relevant divisions of the SABC and all the large organizations which are concerned with the compilation and broadcasting of television programmes. The nature of the work coincides with that of maintenance technicians but is of a much wider scope.

Maintenance and servicing: Many people like to trace faults and repair them. Every problem is a challenge and there are always opportunities to learn something new. Basic principles may remain the same but the design of appliances may differ. Apart from the service which must be rendered to individual users of equipment, there are the repair and service divisions of suppliers which must be manned by trained persons.

### 4. OTHER COURSES ON THE TRIMESTER SYSTEM

The courses mentioned below are also offered on the trimester system but are exceptions to the rule laid down for the training of engineering technicians. For these courses the subjects are prescribed and the National Certificate or National Diploma which is obtained, will also indicate the field of study concerned.

1. National Certificate in Architectural Draughtsmanship. See p. 19.
2. National Certificate for Building Inspectors. See p. 58.
3. National Diploma for Building Surveyors. See p. 59.
4. National Diploma for Construction Supervisors. See p. 59.
5. National Certificate for Inspectors of Works (Building). See p. 65.
6. National Certificate for Technicians (Knitting). See p. 67.
7. National Certificate for Technicians (Spinning). See p. 67.
8. National Certificate for Technicians (Weaving). See p. 67.
9. Telecommunication (Post Office): All fields. See p. 54.



## F. MINING

Admission qualifications: Unless stated otherwise, the minimum admission qualification for the courses is a pass mark in Mathematics and a science subject, for example Physics, Chemistry, Physical Science, on the Standard X or NTC III (N3) level. Candidates who are in possession of a Standard X Certificate or equivalent will, however, receive preference.

Nature and duration of the courses: Unless stated otherwise, the courses extend over four years and are offered on a sandwich basis at the Witwatersrand College for Advanced Technical Education. In some cases the mining schools, which are indicated under some of the courses, partly undertake the theoretical training and all the practical training during the first year. From the second year all the students go to the Witwatersrand College for Advanced Technical Education for theoretical training.

Some of the technical colleges and technical institutes situated in mining areas also offer some of these courses.

Note: Although the existing courses for technicians, including the NTC IV and V, have been integrated in the new certificate courses which have been introduced as from 1 January 1972, the courses for the National Technical Certificate Part IV (Mining) and Part V (Mining) are, for the present, still being offered as in the past.

### 1. ASSAYING

#### NATIONAL DIPLOMA FOR TECHNICIANS (ASSAYING)

##### Subjects

##### Part A

Mathematics T1  
Physics T1  
Geology T1  
Chemistry T1

##### Part B

Assaying (Theory) T1  
Assaying (Practical) T1  
Analytical Chemistry (Theory) T1  
Analytical Chemistry (Practical) T1  
Metallurgy of Gold (Theory) T  
Metallurgy of Gold (Practical) T  
Determinative Mineralogy T

##### Part C

Assaying (Theory) T2  
Assaying (Practical) T2  
Analytical Chemistry (Theory) T2  
Metallurgical Analysis (Theory) T  
Metallurgical Analysis (Practical) T  
Metallurgy (Mining) T1

##### Part D

Metallurgy (Mining) T2  
Metallurgy of Uranium T  
Ore dressing T  
Afrikaans T  
English T

Note: A candidate must produce evidence that he has been employed as a mine assayer or chemist in an inorganic chemical laboratory or metallurgical laboratory for at least FOUR YEARS immediately prior to the completion of the course.

A candidate who has satisfied the examination requirements of Parts A, B and C and can produce proof of having been employed as a mine assayer or chemist in an inorganic chemical laboratory or metallurgical laboratory for at least ONE YEAR immediately prior to the completion of the course may, on application, be awarded a NATIONAL CERTIFICATE FOR TECHNICIANS (ASSAYING).

### 2. COAL MINING

#### NATIONAL DIPLOMA FOR TECHNICIANS (COAL MINING)

The course is so designed that after three years a student should be able to acquire the Mine Overseer's Certificate of Competency and, on completion of the fourth year, the Mine Manager's Certificate of Competency.

## Subjects

### Part A

Mathematics T1  
Geology (Mining) T1  
Surveying (Mining) T1  
Coal Mining T1  
Mine Engineering T1

### Part C

Coal Mining T3  
Coal Mining Plant T  
Surveying (Mining) T3  
Coal Mining Economics T  
Afrikaans T  
English T

### Part B

Geology (Coal Mining) T  
Surveying (Mining) T2  
Coal Mining T2  
Mine Engineering T2

### Part D

Mineral Analysis T  
Mine Management T  
Coal Preparation and Fuels T

**Note:** A candidate must produce evidence that he has been employed on the underground staff of a coal mine for at least FOUR YEARS immediately prior to the completion of the course.

A candidate who has satisfied the examination requirements of Parts A, B and C and can produce proof that he has been employed on the underground staff of a coal mine for at least ONE YEAR immediately prior to completion of the course, may on application be awarded a NATIONAL CERTIFICATE FOR TECHNICIANS (COAL MINING).

This course is supported by the coal mining industry. Learner officials attend 18-week sandwich courses.

### Learner official training centres

Blinkpan Colliery, Witbank - Middelburg Coalfields (General Mining and Investment Company and Anglo-American Corporation).

## 3. EXTRACTION METALLURGY

NATIONAL DIPLOMA FOR TECHNICIANS (EXTRACTION METALLURGY)

### Subjects

#### Part A

Mathematics T1  
Chemistry T1  
Physics T1  
Geology (Mining) T1

#### Part C

Metallurgy of Gold T (Theory)  
Metallurgy of Gold T (Practical)  
Fuels and Refractories T  
Mineral Analysis T  
Extraction Metallurgy T2  
English TA or TB ) one on  
Afrikaans TA or TB ) higher level

#### Part B

Physical Chemistry T1  
Metallurgical Analysis T (Theory)  
Metallurgical Analysis T (Practical)  
Economic Geology T  
Extraction Metallurgy T1

#### Part D

Metallurgy of Uranium T  
Coal Preparation and Fuels T  
Extraction Metallurgy T3  
Ore Treatment Practice T

## 4. FOUNDRY ENGINEERING

NATIONAL DIPLOMA FOR TECHNICIANS (FOUNDRY ENGINEERING)

The Diploma is generally recognized in South Africa and is supported by the Steel Engineering Industries of South Africa and the South African Institute of Foundrymen. Bursaries are available.

### Subjects

#### Part A

Mathematics T1  
Physics T1

#### Part B

Physical Metallurgy T1  
Fuels and Refractories T

Part A (continued)

Chemistry T1  
Engineering Drawing T1  
Foundry Technology T1  
Languages (Afrikaans and English) T

Part C

Physical Metallurgy T2  
Mechanical and Thermal Treatment T OR Foundry Engineering T  
Sand Technology T1  
Foundry Technology T3  
Foundry Projects T1

Part B (continued)

Patternmaking T  
Engineering Drawing T2  
Mechanical and Thermal Treatment T OR  
Foundry Engineering T  
Foundry Technology T2

Part D

Destructive and Non-destructive Testing of Metals T  
Melting Practices for Foundry Metals and Alloys T  
Sand Technology T2  
Foundry Technology T4  
Foundry Projects T2

5. METALLIFEROUS MINING

NATIONAL DIPLOMA FOR TECHNICIANS (METALLIFEROUS MINING)

The course is so designed that after three years a student should be able to acquire the Mine Overseer's Certificate of Competency and, on completion of the fourth year, the Mine Manager's Certificate of Competency.

Subjects

Part A

Mathematics T1  
Geology (Mining) T1  
Surveying (Mining) T1  
Metalliferous Mining T1  
Mine Engineering T1  
Mining Economics T1

Part C

Metalliferous Mining T3  
Mining Economics T3  
Mining Plant T  
Surveying (Mining) T3  
English T  
Afrikaans T  
Geology (Mining) T3

Part B

Geology (Mining) T2  
Surveying (Mining) T2  
Metalliferous Mining T2  
Mine Engineering T2  
Mining Economics T2

Part D

Metallurgical Practice T  
Mineral Analysis T  
Mine Management T  
Metalliferous Mining T4

Note: A candidate must produce evidence that he has been employed on the underground staff of a metalliferous mine for a period of at least FOUR YEARS immediately prior to the completion of the course.

A candidate who has satisfied the examination requirements of Parts A, B and C and can produce proof that he has been employed on the underground staff of a metalliferous mine for a period of at least ONE YEAR immediately prior to completion of the course, may, on application, be awarded a NATIONAL CERTIFICATE FOR TECHNICIANS (METALLIFEROUS MINING).

Learner official training centres

Rand Mines, Oos-Geduld, West Rand Consolidated, Randfontein Estates, Hartebeesfontein, Venterspost, Western Reefs, Anglo-American Corporation (Welkom).

6. METALLURGY

NATIONAL DIPLOMA FOR TECHNICIANS (METALLURGY)

For particulars of this course see p. 45.

7. MINE SAMPLERS

NATIONAL TECHNICAL CERTIFICATE (MINE SAMPLERS)

Nature and duration of the course: The course extends over two years and is offered on a sandwich basis.

Part A

Mathematics (Mining) I  
Geology (Mining) T1  
Mining Economics T1  
Surveying (Mining) T1

Part B

Mathematics (Mining) II  
Geology (Mining) T2  
Mining Economics T2

Note: A candidate must produce evidence that he has been employed as a mine sampler for a period of at least ONE YEAR immediately prior to the completion of the course.

Learner official training centres

Venterspost, Carletonville, Hartebeesfontein-Buffelsfontein, Virginia, Odendaalsrus.

8. MINE SURVEYORS

NATIONAL CERTIFICATE FOR TECHNICIANS (MINE SURVEYORS)

Nature and duration of the course: The course extends over two and a half years and is offered on a sandwich basis.

Part A

Mathematics (Mining) I  
Geology (Mining) T1  
Mining Economics T1  
Surveying (Mining) T1

Part B

Mathematics (Mining) II  
Geology (Mining) T2  
Mining Economics T2  
Surveying (Mining) T2

Part C

Mathematics T1  
Geological Fault Sections and Projections T  
Mining Economics T3  
Surveying (Mining) T3

Note: A candidate must produce evidence that he has been employed as a mine surveyor for a period of at least ONE YEAR immediately prior to the completion of the course.

Learner official training centres

Venterspost, Carletonville, Hartebeesfontein-Buffelsfontein, Virginia, Odendaalsrus.

9. MINING

(i) NATIONAL TECHNICAL CERTIFICATE PART III (MINING)

Admission qualification: A Standard X Certificate or equivalent with either Mathematics and Physics or Chemistry or Mathematics and Physical Science.

Nature and duration of the course: The course may be taken on a sandwich basis or through correspondence. Candidates must pass in at least three of the subjects mentioned below and produce proof of at least one year's appropriate experience in industry.

Subjects

Mathematics T1	Mine Engineering T1
Metalliferous Mining T1 OR	Mining Ventilation I
Coal Mining T1	Chemistry T1
Surveying (Mining) T1	Physics T1
Geology (Mining) T1	Metallurgy (Mining) T1
Mining Economics T1	

(ii) NATIONAL TECHNICAL CERTIFICATE PART IV (MINING)

Admission qualification: Candidates must hold the National Technical Certificate Part III (Mining).

Nature and duration of the course: The course may be taken on a sandwich basis or

through correspondence. Candidates must pass in at least three of the subjects mentioned below and produce proof of at least two years' appropriate experience in industry.

Subjects.

Metalliferous Mining T2 OR	Analytical Chemistry (Theory) T1
Coal Mining T2	Assaying (Theory) T1
Surveying (Mining) T2	Determinative Mineralogy T
Geology (Coal Mining) T OR	Metallurgy of Gold (Theory) T
Geology (Coal Mining) T	Production of Iron and Steel T1
Mining Economics T2	Mathematics T2
Mine Engineering T2	
Mining Ventilation II	

(iii) NATIONAL TECHNICAL CERTIFICATE PART V (MINING)

Admission qualification: Candidates must hold the National Technical Certificate Part IV (Mining).

Nature and duration of the course: The course may be taken on a sandwich basis or through correspondence. Candidates must pass in at least three of the subjects mentioned below and produce proof of at least three years' appropriate experience in industry.

Subjects

Metalliferous Mining T3 OR	Mining Plant T OR
Coal Mining T3	Coal Plant T
Geology (Mining) T3	Assaying (Theory) T2
Surveying (Mining) T3	Metallurgy (Mining) T2
Mining Economics T3 OR	Ore Dressing T
Coal Mining Economics T	Production of Iron and Steel T2

(iv) NATIONAL TECHNICAL DIPLOMA (MINING)

Admission qualification: Candidates must hold the National Technical Certificate Part V (Mining).

Nature and duration of the course: The course may be taken on a sandwich basis or through correspondence. Candidates must pass in at least six of the subjects listed below and produce proof of at least four years' appropriate experience in at least one of the following industries: Metalliferous, Non-metalliferous, an Assayer's office, Chemical laboratory, Metallurgical laboratory or plant or in the reduction works.

Subjects

Metalliferous Mining T3 OR	Assaying (Theory) T2
Coal Mining T3	Mining Plant T OR
Geology (Mining) T3	Coal Mining Plant T
Surveying (Mining) T3	Metallurgy of Uranium T
Mining Economics T3 OR	Human Factor in Management T
Coal Mining Economics T	Costing and Estimating T
Metallurgy (Mining) T2 OR	English TA OR Afrikaans TA
Metallurgy of Gold (Theory)	
Ore Dressing T OR	
Production of Iron and Steel T2	

10. MINING GEOLOGY

NATIONAL DIPLOMA FOR TECHNICIANS (MINING GEOLOGY)

Subjects

Part A

Mathematics T1  
Chemistry T1  
Physics T1  
Determinative Mineralogy T  
Geology (Mining) T1

Part B

Practical Geology T1  
Mineralogy and Petrology T  
Mining Economics T1  
Palaeontology and Stratigraphy T

## Part C

Practical Geology T2  
Surveying (Mining) T1  
Geomorphology and Structural  
Geology T  
English T  
Afrikaans T  
Metalliferous Mining T1

## Part D

Economic Geology T  
Practical Geology T3  
Ore Dressing T  
Field Mapping T  
Earth History and Geophysics T

Note: A candidate must produce evidence that he has been employed on the technical staff of the mining industry for a period of at least FOUR YEARS immediately prior to the completion of the course.

A candidate who has satisfied the examination requirements of Parts A, B and C, and can produce evidence of having been employed on the technical staff of the mining industry for a period of at least ONE YEAR immediately prior to the completion of the course, may on application be awarded a NATIONAL CERTIFICATE FOR TECHNICIANS (MINING GEOLOGY).

### Learner official training centres

Rand Mines, East Geduld, West Rand Consolidated, Randfontein Estates, Hartbeesfontein, Venterspost, Western Reefs, Anglo-American Corporation (Welkom).

Vocational service: Mining on a large scale is typically South African. It has to a great extent been the backbone of South Africa's economy for almost a century and tremendous expansion in the field of the exploitation of minerals is going on apace. The country has the world's largest known deposits of gold, metals in the platinum group, chrome, fluor spar, manganese, antimony, vanadium and vermiculite and Africa's largest deposits of iron, coal and uranium. Millions of rand are spent on opening and controlling mines and in order to protect these investments, the mining industry provides free training for mining engineers, mining officials and mineworkers. Full salaries are also paid for the duration of the training.

Mining is an attractive career for young men and there are exceptional opportunities for rapid advancement. The mining industry employs approximately 600 000 persons. Candidates are purposefully trained and have a wide choice from the various fields. The diploma courses in metal and coal mining, for example, provide pupils with the necessary knowledge to write examinations in the academic subjects which are required for the Government Certificates of Competency for Mine Managers. Such certificates are prerequisites for promotion to managerial and consulting positions in the large mining groups. In this way the certificate course for mine surveyors provides the necessary training for the Certificate of Competency in Mine Surveying. An ambitious candidate can advance from chief surveyor at a large mine to group surveyor. The diploma courses in, for example, assaying and reduction work, equip a student with the necessary technical knowledge to occupy senior posts in assaying offices or reduction works at various mines.

Underground experience in a mine is essential for most promotion posts. Intensive medical research and modern methods of combating dust in mines have greatly lessened the danger of silicosis. It has been calculated, for instance, that a healthy person will be able to work underground for thirty years or longer without any real danger to his health.

## G. P H Y S I C A L S C I E N C E S A N D R E L A T E D F I E L D S

### 1. ANALYTICAL CHEMISTRY

#### NATIONAL DIPLOMA FOR TECHNICIANS (ANALYTICAL CHEMISTRY)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects. A candidate must be employed in a chemical laboratory or chemical manufacturing concern. (Written proof of at least eighteen months' approved service must be submitted before the Diploma will be issued by the Department of National Education.)

Nature and duration of the course: The course extends over three years and is offered on a sandwich or part-time basis.

Some colleges for advanced technical education offer the theoretical part of the course over a continuous period. After that practical training takes place in a suitable laboratory for a period equal to that of the theoretical part. During this training the student receives a salary from his employer.

N.B.: Students employed by the Atomic Energy Board attend this course at the Pretoria College for Advanced Technical Education.

Part I

Physics T1  
Physical Chemistry T1  
Inorganic Chemistry T1  
Organic Chemistry T1  
Analytical Chemistry T1  
Analytical Chemistry T1 (Practical)  
Laboratory Organization and Practice

Part II

Physical Chemistry T2  
Inorganic Chemistry T2  
Organic Chemistry T2  
Analytical Chemistry T2  
Mathematics T  
Chemistry T2 (Practical)

Optional subjects

Chemistry T1  
Nuclear Physics and Radio-isotopes T  
Languages T A/B  
Engineering Drawing T1  
Basic Electronics and Practical Measurement Technique T  
Mathematics T2A  
Uranium and Nuclear Energy T OR  
Advanced Nuclear Physics T  
Welding Practice T (Non-examination subject)  
Physics T2  
Nuclear Physics T1  
Vacuum Technology T1

Training centres

Colleges for Advanced Technical Education.

Vocational service: An analytical chemist is usually employed by institutions in which any form of chemical work is performed. It is his duty, normally in a laboratory, to determine what chemical materials, and what quantity of each, are present in a certain substance. There are many chemical occupations which offer a wide scope of interesting opportunities in the government service, semi-government service and private undertakings.

Chemistry is the study, based on the natural sciences, of the structure, composition and properties of material, as well as of the processes of change which it undergoes. The importance of this study is clearly reflected in the subject components of these and the other courses which are discussed in the section Physical Sciences and related fields. Although most of the courses are specialized, the subjects Chemistry (one or more branches) and Physics are excluded from the courses in only a few cases. (Theoretical chemistry and theoretical physics supplement each other.) As a result of this, able technicians have job opportunities in a wide variety of organizations, industries or trades which are concerned with production and/or research.

The chemical industries have, notwithstanding the effect of certain restraining factors such as, for instance, an acute shortage of specialized technicians, grown into the fourth largest sector in secondary industry in the RSA, with a capital investment of more than R1 000 million and a production of more than R600 million per annum. These industries are not static and the wide variety of products already being supplied provide an indication of their vitality and development potential. Greater expansion can be expected, provided that sufficient capital and trained manpower, including technicians, are available.

Production: A fleeting glance at some of the industries which employ technicians with

training in the physical sciences and the use of a few examples serve to provide a picture of this extensive field.

Iscor: The giant steel industry which employs more than 35 000 persons in order to meet the demands of its widespread activities. Among these are a considerable number of engineers and other professional persons who are assisted by trained technicians who, in their turn, concentrate particularly on analytical work in the many laboratories.

Sasol: The largest economical oil-from-coal installation in the world, which produces crucially important petrol, oil, industrial gas and other chemicals and for which the services of technicians are indispensable.

The African Explosives and Chemical Industries: This organization (which was opened by Pres. Kruger in 1896) initially only produced explosives for the mines. Today its production has been extended to include 130 000 tons of ammonia, 140 000 tons of nitric acid and 45 000 tons of polythene annually, in addition to superphosphate, methanol, etc. The development is continuing and 15 000 persons, of whom many are trained technicians, are at present employed at the six factories.

Further examination reveals that the fertilizer industry, for example, supplies products to the value of R50 million annually, while the figure for the pharmaceutical industry is R80 million per annum. There are also the painting and plastic industries which are growing at a phenomenal rate; the mining industry with its extensive activities and contribution to the country's revenue; the crucially important agricultural industry; the South African Railways, Posts and Telegraphs and several other larger and smaller industries and trades which require the services of trained technicians to ensure maximum production.

Research: Since research is extremely costly, research projects are centralised as far as possible. Trained technicians are needed to assist researchers in carrying out their projects as efficiently as possible.

The CSIR: This organization, which is the largest of its kind in the country, not only has the best equipment and laboratories but also enjoys international status. Although most of the posts exist at the headquarters in Pretoria, there are also job opportunities for technicians in the large number of centres scattered practically throughout the country. Some of the research institutes are the following: The National Building Research Institute, the National Chemical Research Laboratory, the National Institute for Water Research, the National Mechanical Engineering Research Institute, the National Physical Research Laboratory, the National Institute for Road Research, the National Institute for Telecommunications Research and the National Institute for Defence Research. There are also research units of the Council which serve particular industries such as the wood, ceramics, sugar, leather, painting, fishing and wool industries. Selected matriculants are employed directly after passing Std 10 and they are granted the opportunity of becoming qualified technicians by means of further study and in-service training.

Pelindaba: This is the place near Pretoria where the Atomic Energy Board is engaged in an extremely important task and where hundreds of persons carry out their daily duties in connection with the peacetime use of nuclear energy. Among them are also the technicians (experimental officers) who are trained in the particular fields on a sandwich basis at the Pretoria College for Advanced Technical Education and in the laboratories of the Board. Pupil technicians are trained in, for example, the following fields: Mechanical Engineering, Physical Metallurgy, Physics, Chemistry, Electronics and Instrumentation and Control. The task of technicians mainly consists in the installation and control of the apparatus which is required for research. However, there are also the Designers/Draughtsmen, Planners, Inspectors and Reactor Operators who perform challenging technical tasks. Pupil technicians receive full salary during the training period and the Council also pays class and examination fees if the candidates are successful. There are good prospects of promotion but this depends on the officer's approach to his task.

The SABS: The Bureau consists of six main laboratories, each subdivided into a number of particular laboratories, viz the Chemical Technology Department with the divisions of industrial chemistry, general chemistry, physical chemistry, metallurgy, water, organic coatings (paints, etc.), rubber and plastic materials, petrol and bitumen; the Department of Food Technology with the divisions of textile technology



(chemical), textile technology (physical), clothing, leather and footwear, wood, paper; the Department of Biological Sciences with divisions for food inspection, microbiology and mycology, foods and feeds chemistry, entomology, pharmaceutical and vitamin products; the Department of Civil Engineering with divisions for primary building materials, secondary building materials, structure and fire testing laboratories, architecture, furniture and timber products, packaging; the Electrical Engineering and Physics Department with divisions for electronics and acoustics, photometry and lighting, general physics, explosion hazards, electrical technology, electrical appliances for buildings; the Department of Mechanical Engineering with divisions for general mechanical engineering technology, non-destructive tests, fluid technology, industrial safety, automotive engineering, welding and fabrication technology, metrology and toolroom technology.

It is the aim of all these divisions to compile specifications for the standardization of various products. There are, consequently, job opportunities in a large variety of fields for which persons with divergent qualifications in engineering, professional and technical fields are required. Matriculants are appointed to technical posts in the various departments and, with the assistance of the SABS, can further their studies at a college for advanced technical education in the field in which they are active. The SABS has a high regard for personnel with suitable qualifications.

## 2. ANALYTICAL CHEMISTRY (PUBLIC SERVICE)

### NATIONAL DIPLOMA FOR TECHNICIANS (ANALYTICAL CHEMISTRY)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects.

Nature and duration of the course: The course extends over three years. Approximately  $4\frac{1}{2}$  months of each year are spent at a college for advanced technical education where theoretical and related practical instruction is given. The rest of the three years of training is devoted to practical training in a specialized branch of the Government department in which the trainee has been appointed.

#### First semester

Chemistry T1  
Physics T1  
Laboratory Organization and Practice T  
Mathematics T (Lab. Tech.)  
Candidate's Second Language TB

#### Second semester

Analytical Chemistry T1  
Analytical Chemistry (Practical) T1  
Inorganic Chemistry T1  
Organic Chemistry T1  
Physical Chemistry T1  
Geology T1

#### Third semester

Analytical Chemistry T2  
Chemistry (Practical) T2  
Inorganic Chemistry T2  
Organic Chemistry T2  
Physical Chemistry T2

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: See p. 38.

## 3. CERAMICS TECHNOLOGY

### NATIONAL CERTIFICATE FOR TECHNICIANS (CERAMICS TECHNOLOGY)

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over two years and is offered on a sandwich basis or one year's full-time college attendance and one year's practical in-service training.

#### Part A

Ceramics Physics T  
Fuel Technology T

#### Part B

Ceramics Chemistry T  
Utilisation of Power T

Ceramics Geology T  
Glass Technology T  
Ceramics TA, TB  
Practical Ceramics T1  
English TA or Afrikaans TA

Ceramics TC, TD, TE, TF  
Practical Ceramics T2 (including a project)

Training centre

Pretoria College for Advanced Technical Education.

Vocational service: Students are normally sponsored by their employers in the Ceramics industry and a list of firms engaged in Ceramics is available from the Pretoria College for Advanced Technical Education. The certificate in Ceramic Technology equips the students for responsible positions in the brick, refractory, pottery, tile, glass and porcelain industries.

This industry is large, vigorous and progressive and there are many managerial and technical posts for lively and intelligent young men. In addition, the students usually receive their full salary while undergoing training.

4. CHEMICAL TECHNOLOGY: PLASTICS

NATIONAL DIPLOMA FOR TECHNICIANS IN CHEMICAL TECHNOLOGY (PLASTICS)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects.

Nature and duration of the course: The course extends over four years and is offered on a full-time, part-time or sandwich basis.

First semester

Chemistry T1  
Physics T1  
Engineering Drawing T1  
Mathematics T

Second semester

Analytical Chemistry T1  
Analytical Chemistry (Practical) T1  
Physical Chemistry T1  
Organic Chemistry T1  
Inorganic Chemistry T1  
Afrikaans TA/B  
English TA/B

Third semester

Physical Chemistry T2  
Organic Chemistry T2  
Practical Physical and Organic Chemistry T2  
Preparation and Properties of Polymers T1  
Processing of Plastic Materials (Theory) T1  
Processing of Plastic Materials (Practical) T

Fourth semester

Physics of Polymers T  
Testing of Plastic Materials T (Theory and Practical)  
Preparation and Properties of Polymers T2  
Processing of Plastic Materials T2 (Theory and Practical)  
Production, Planning and Control T1

Practical training: Practical training of full-time students takes place in an approved laboratory for a period of 4 semesters. During practical training the student is paid by his employer. In cases where practical experience has been acquired prior to enrolment it is possible, by application to the Department of National Education, to obtain full or partial exemption.

Training centres

Colleges for Advanced Technical Education.

Vocational service: The plastics industry is a specialized combination of chemistry and engineering. Technicians are trained for the laboratory requirements of the plastics industry but much attention is also devoted to production aspects. This industry is developing so rapidly that it is estimated that, by the end of the century, the production of plastic materials will exceed that of steel. Apart from the private sector, opportunities also exist in, for example, the service of the CSIR and SABS.

5. CHEMISTRY

NATIONAL HIGHER DIPLOMA IN CHEMISTRY

Admission qualifications

To Part I : A National Diploma for Technicians (Analytical Chemistry) or a B.Sc. degree with Chemistry III or an equivalent qualification.

To Part II : Successful completion of all the subjects of Part I.

Nature and duration of the course: The course extends over one year of full-time or part-time study and consists of Parts I and II. No in-service training is required.

Subjects

Part I

Mathematics THC  
Inorganic Chemistry THC  
Inorganic Chemistry (Practical) THC  
Organic Chemistry THC  
Organic Chemistry (Practical) THC  
Basic Electronics THC (Examined internally - does not appear on diploma)  
Information Retrieval and Documentation THC (non-examination subject)

Part II

Physical Chemistry THC  
Physical Chemistry (Practical) THC  
Analytical Chemistry THC  
Analytical Chemistry (Practical) THC

Training centres

Colleges for Advanced Technical Education.

Vocational service: See p. 38.

6. CHEMISTRY : DEFENCE

NATIONAL DIPLOMA FOR TECHNICIANS ( CHEMISTRY : DEFENCE )

Admission qualification: The minimum requirements for admission to the course are passes in Mathematics and Physical Science or another acceptable science subject at the Standard X level.

Nature and duration of the course: The course extends over four semesters and is usually taken over a period of two years' full-time study.

Part A

Mathematics T1  
Physics T1  
Chemistry T1  
Laboratory Organization and Practice T

Part B

Organic Chemistry T1  
Physical Chemistry T1  
Inorganic Chemistry T1  
Analytical Chemistry (Theory) T1  
Analytical Chemistry (Practical) T1

Part C

Languages T  
Workshop Technology T1  
Workshop Technology T2  
Industrial Administration  
Mathematics T2

Part D

Physical Chemistry T2  
Organic Chemistry T2  
Inorganic Chemistry T2  
Analytical Chemistry (Theory and Practical) T2

Note

Part C may be done after Part D.

Training centre

Pretoria College for Advanced Technical Education.

Vocational service: Chemistry plays an important part in the country's military preparedness by the development and improvement of explosives; chemical propulsion, for instance, remains the most suitable practical source of energy for rockets.

The course is consequently primarily intended for persons who plan to pursue an occupation as chemical technician in the SA Defence Force.

See also p. 38.

7. CHEMISTRY : PLANT OPERATION

NATIONAL DIPLOMA FOR TECHNICIANS (CHEMISTRY : PLANT OPERATION)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects.

Nature and duration of the course: The course extends over three years and is offered on a sandwich or part-time basis.

First semester

Inorganic Chemistry T1  
Physics T1  
Organic Chemistry T1  
Mathematics T

Second semester

Analytical Chemistry (Theory) T1 OR  
Chemical Technology T  
Analytical Chemistry (Practical) T1 OR  
Applied Thermodynamics T1  
Physical Chemistry T1  
Laboratory Organization and Practice T OR  
Engineering Drawing T1

Third semester

Chemical Plant T  
Chemical Works Organization and Management T  
Chemical Technology T OR Applied Thermodynamics T1  
(if not taken in the second semester)  
Unit Operations T  
Instrumentation T  
Physics T2 (Optional)

Training centres

Colleges for Advanced Technical Education.

Vocational service: The plant operator technician is employed in a chemical plant and is trained in the knowledge of the control, maintenance and efficient functioning of large-scale manufacturing processes. He is also concerned with exploratory and full-scale plant development work. Chemical plant operators are employed by the larger organizations such as Iscor and SASOL.

See also p.38.

8. INDUSTRIAL RADIOGRAPHY;

ULTRASONIC TESTING;

GENERAL NON-DESTRUCTIVE TESTING METHODS and

NON-DESTRUCTIVE TESTING

(i) NATIONAL CERTIFICATE IN INDUSTRIAL RADIOGRAPHY

Admission qualification: A Standard X Certificate or equivalent with Mathematics as a subject.

Nature and duration of the course: The course extends over one year, i.e. one semester of college attendance and one semester of in-service training.

Subjects

Mathematics T OR Engineering Drawing T1 if Mathematics has already been taken in Ultrasonic Testing	Physics for Industrial Radiography T Industrial Radiography T Industrial Radiography T (Practical)
Physical Metallurgy T1A OR T2A if T1A has already been taken under Ultrasonic Testing	

Note: Candidates may commence with either the National Certificate in Industrial Radiography or the National Certificate in Ultrasonic Testing, but both have to be completed before the National Certificate in General Non-destructive Testing Methods can be taken.

(ii) NATIONAL CERTIFICATE IN ULTRASONIC TESTING

Admission qualification: A Standard X Certificate or equivalent with Mathematics as a subject.

Nature and duration of the course: The course extends over one year, i.e. one semester of college attendance and one semester of in-service training.

Subjects

Mathematics T OR Engineering Drawing T1 if Mathematics has already been taken in Industrial Radiography	Physics for Ultrasonic Testing T Ultrasonic Testing T Ultrasonic Testing T (Practical)
Physical Metallurgy T1A OR T2A if T1A has already been taken in Industrial Radiography	

Note: Candidates may commence with either the National Certificate in Industrial Radiography or the National Certificate in Ultrasonic Testing, but both have to be completed before the National Certificate in General Non-destructive Testing Methods can be taken.

(iii) NATIONAL CERTIFICATE IN GENERAL NON-DESTRUCTIVE TESTING METHODS

Admission qualification: The two certificates, viz the National Certificate in Industrial Radiography AND the National Certificate in Ultrasonic Testing.

Nature and duration of the course: The course extends over one year, i.e. one semester of college attendance and one semester of in-service training.

Subjects

Physics for General Non-destructive Testing T	Mechanical Metallurgy T Metallurgy of Welding and Soldering T
General Non-destructive Testing T	

(iv) NATIONAL DIPLOMA IN NON-DESTRUCTIVE TESTING

Admission qualification: The three certificates, viz the National Certificate in Industrial Radiography AND the National Certificate in Ultrasonic Testing AND the National Certificate in General Non-destructive Testing Methods.

Nature and duration of the course: The course extends over one year, i.e. one semester of college attendance and one semester of in-service training. The total duration before the Diploma can be obtained is thus four years.

Subjects

Advanced Non-destructive Testing T	Non-destructive Test Control T
Advanced Non-destructive Testing T (Practical)	Metal Forming T Quality Control T

Training centres

Colleges for Advanced Technical Education.

Vocational service: A great demand exists for people trained in these fields, especially in the metal industry but also in some of the Government departments and semi-government establishments.

See also p. 45.

9. MATERIAL TESTING

NATIONAL DIPLOMA IN MATERIAL TESTING

Admission qualification: A Standard X Certificate or equivalent with Mathematics as a subject.

Nature and duration of the course: The course extends over three years, i.e. eighteen

months of college attendance and eighteen months of in-service training.

First semester

Mathematics T1  
Applied Mechanics T1  
Drawing (Surveyors) T1  
Surveying T1

Second semester

Bitumen Technology T1  
Concrete Technology T1  
Geology T1  
Soil Mechanics (Material Testing) T1

Third semester

Bitumen Technology T2  
Concrete Technology T2  
Geology T2  
Soil Mechanics (Material Testing) T2

Training centres

Colleges for Advanced Technical Education.

Vocational service: The planning of projects by engineers requires a thorough knowledge of the quality and other properties of material to be used for construction. Furthermore they require certain technical information concerning the site. For this purpose the engineers are assisted by technicians trained in material testing. They obtain information by sampling and testing. Although some of the surveying has to be done on the construction site, the greater part of the technician's work is done in a laboratory.

Opportunities for these technicians exist in the private sector (construction companies), though they are mainly employed by the Departments of Transport and Water Affairs, as well as by the four provincial administrations and the Administration of South-West Africa. Promotion to the higher ranks in the Public Service depends firstly on the number of vacancies and secondly on an officer's merits compared with those of his fellow officers of equal rank. See also p.6 for the opportunities for advancement in the Public Service.

10. METALLURGY

NATIONAL DIPLOMA FOR TECHNICIANS (METALLURGY)

Admission qualification: The minimum qualification for admission to the course is a pass in Mathematics and Chemistry, Physics or Physical Science or an equivalent subject on Standard X level or on NTC III (N3) level. A candidate must also submit proof that he is employed in the metallurgy industry.

Nature and duration of the course: The course extends over four years and is offered on a sandwich or part-time basis.

Part A

Mathematics T1  
Physics T1  
Chemistry T1  
Production of Iron and Steel T1  
Languages T

Part B

Physical Chemistry T1  
Physical Metallurgy T1  
Fuels and Refractories T  
Metallurgical Analysis T (Theory and Practical)

Part C

Physical Metallurgy T2  
Production of Iron and Steel T2  
Mechanical and Thermal Treatment T  
Non-Ferrous Extraction Metallurgy T

Part D

Foundry Metallurgy T  
Properties and Applications of Metals and Alloys T  
Destructive and Non-Destructive Testing of Metals T

Training centres

Colleges for Advanced Technical Education.

Vocational service: Metallurgists, whose concern is with the science and technology of metals, can be divided into three broad groups, viz the extractive metallurgists who process ore and extract the metal from it, the manufacturing metallurgists who

process metal into serviceable alloys, and the physical metallurgists whose main task is to study the physical behaviour of processed metals and alloys. The National Institute for Metallurgy serves as a research centre for practically the entire South African mineral industry, particularly for research in extractive metallurgy. The Institute has also established a number of research units, while some mining companies also undertake investigations in their own laboratories.

In the metal exploitation and manufacturing industry, which is making great progress in South Africa, technicians are required to assist engineers and other professional persons in the execution of their duties. The field in which a person is interested and trained will determine his occupational circumstances but there are ample opportunities for promotion for the dedicated worker.

For further particulars in connection with employment, remuneration, etc., candidates are referred, among others, to the following institutions which, in the main, also offer the job opportunities: The Chamber of Mines, the individual mining groups, Iscor, the National Institute for Metallurgy, the AEB, Armaments Board, UCOR, SABS and the SA Defence Force.

#### 11. METEOROLOGY

##### NATIONAL DIPLOMA FOR TECHNICIANS (METEOROLOGY)

Admission qualification: A Standard X Certificate with Mathematics.

Nature and duration of the course: The course extends over three years and includes three semesters of theoretical training which is provided partly by the Pretoria College for Advanced Technical Education and partly by the Weather Bureau in Pretoria. The remaining part of the three years is devoted to practical in-service training at one of the weather stations.

##### First semester

Mathematics T  
Physics T1  
Geography (Meteorology)  
Meteorological Practice  
Meteorology and Aviation Knowledge I  
Second Language TB

##### Second semester

Electronics (Meteorology)  
Climatology I  
Meteorological Instruments I  
Meteorology and Aviation Knowledge II

##### Third semester

Climatology II  
Meteorological Instruments II  
Meteorology III  
Aviation Knowledge III

Vocational service: A person interested should apply to the Department of Transport, Pretoria for an appointment to the post of Pupil Technician in Meteorology.

The technician (Meteorology) is the person who makes the basic observations on the weather, compiles them in orderly fashion and directs them through the correct channels. These observations consist of visual, instrumental and aerological surveys. Although the South African Weather Bureau has its headquarters in Pretoria, most posts for technicians exist at the forecast offices at the most important airports, at the air force stations and the smaller weather offices. For the adventurous there are three weather stations in the far southern ocean, viz Marion Island, Gough Island and SANAE in Antarctica. The staff members at these weather stations are all volunteers. Senior technicians who have the necessary aptitude and experience are appointed to the forecasting services of the Weather Bureau for supplying weather forecasts by means of the radio and television, the press and the telephone.

See also p.6 for opportunities for advancement in the Public Service.

#### 12. MUNITION

##### NATIONAL DIPLOMA IN MUNITION

Admission qualification

(a) Students must be in possession of one of the following certificates including

the subjects Afrikaans, English, Physical Science and Mathematics:

- (i) National Senior Certificate
  - (ii) School-leaving Certificate
  - (iii) National Technical Certificate Part III, with both official languages at the Senior level
  - (iv) Matriculation Certificate of the Joint Matriculation Board.
- (b) Students must be approved by the SA Defence Force.

Nature and duration of the course: The course extends over four years. The National Diploma in Munition can be awarded to military personnel or civilians who comply with the following requirements:

- (a) Security clearance by the SA Defence Force
- (b) Active employment in an undertaking which deals with explosives
- (c) Pass marks in the prescribed subjects and successful completion of the practical projects in the fourth year of the course.

#### First year

- (i) Training at the Military Academy (Military personnel only)
- (ii) Training at the Ammunition School (All candidates)

#### Second year

##### First semester

Chemistry T1  
Physics TB1  
Mathematics T (Lab. Techn.)  
Engineering Drawing T1  
Languages TA/TB (one on higher level)

##### Second semester

Applied Mechanics T1  
Chemistry of Explosives T1  
Mathematics T2A  
Physical Metallurgy T1A  
Principles of Electricity T1

#### Third year

##### First semester

Training by employer

##### Second semester

Physics TB2  
Chemistry of Explosives T2  
Chemistry of Explosives T2 (Practical)  
Strength of Materials T1  
Mechanical Metallurgy T  
Basic Electronics and Practical  
Measurement Technique T

#### Fourth year

##### First semester

Physical Metallurgy T2A  
Strength of Materials T2  
Metrology T  
Non-destructive Testing T  
Corrosion and Protective Coating T

##### Second semester

Practical training by employer

##### Training centre

Pretoria College for Advanced Technical Education.

Vocational service: Candidates who wish to take this course and are planning a career in the South African Defence Force are selected beforehand. The Defence Force, with all its branches (see p. 170) offers favourable prospects of promotion and persons rendering outstanding service can, for instance, in the course of time, become explosives experts with the rank of officer. The Armaments Board as well as industries which manufacture explosives and the chemical constituents of explosives also employ persons with this qualification.

### 13. PAINT SCIENCE

- (i) NATIONAL DIPLOMA FOR TECHNICIANS (PAINT SCIENCE)

Admission qualification: The minimum requirement is Mathematics and an appropriate



science subject, for example Chemistry, Physics and Physical Science on Standard X level or equivalent. A Standard X Certificate is, however, preferable.

Nature and duration of the course: The course extends over three years and is offered on a part-time basis.

Part A

Chemistry T1  
Mathematics T (Lab. Tech.)  
Paint Technology T1 (Theory and Practical)  
Laboratory Organization and Practice T

Part B

Physics T1  
Organic Chemistry T1  
Paint Materials T1 (Theory and Practical)  
Paint Manufacture T (Theory and Practical)

Part C

Analytical Chemistry T1  
Organic Chemistry T2  
Afrikaans T A/B  
English T A/B  
Paint Materials T2 (Theory and Practical)  
Resins and Polymers T (Theory and Practical)  
Paint Formulation T (Theory and Practical)

(ii) NATIONAL CERTIFICATE FOR TECHNICIANS (PAINT SCIENCE)

This certificate will be issued after successful completion of Parts A and B of the Diploma course and after one year's practical experience.

Training centres

Colleges for Advanced Technical Education.

Vocational service: The paint technologist is mainly trained to handle three sections of the profession, viz the analysis of paints, the testing, control and guarantee of the paint, and research in connection with new products. These duties are performed in well-equipped laboratories in factories. Trained persons in the service of the SABS are concerned with testing paints for reliability and quality.

The paint industry in South Africa is well developed and refined. Paint manufacture to-day represents a considerable part of the chemical industry in general. More than seventy paint factories annually produce close to a hundred million litres of paint and offer employment to thousands.

Among the most important employers of paint technologists are the paint manufacturers, the SA Railways, the SABS, the CSIR (Building Research), the Paint Research Institute in Durban, Iscor, municipalities, large industries and motorcar manufacturers.

14. PHYSICAL METALLURGY

NATIONAL DIPLOMA IN PHYSICAL METALLURGY

Admission qualification: A Standard X Certificate with Mathematics and a Physical Science subject.

Nature and duration of the course: The course extends over four years, i.e. four semesters of college attendance and four semesters of practical in-service training.

Part A

Mathematics T  
Chemistry T1  
Physics T1  
Physical Chemistry T1A  
Afrikaans TA/TB ) one on the  
English TA/TB ) higher grade

Part B

Physical Metallurgy T2A  
Vacuum Technology T1  
Physics T2 OR Electric and Thermodynamic Properties of Materials T  
Physical Chemistry T1  
Basic Quality Control T  
Corrosion and Protective Coatings T

Part C

Basic Electronics and Practical  
Measurement Technique T  
Mathematics T2A  
Engineering Drawing T1  
Nuclear Physics T1  
Metallography T  
Quality Control - Organization  
and Practice T

Training centres

Colleges for Advanced Technical Education.

Vocational service: See p. 45.

Part D

Metal Forming T  
Mechanical Metallurgy T  
Metallurgy of Welding and Soldering T  
Non-destructive Testing T  
Quality Control T

15. PHYSICS : ANALYTICAL PHYSICS

NATIONAL DIPLOMA FOR TECHNICIANS (ANALYTICAL PHYSICS)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects.

Nature and duration of the course: The course extends over three years and is offered on a sandwich basis.

First semester

Laboratory Organization and Practice T  
Mathematics T  
Instrumentation T  
Physics T1  
Chemistry T1

Second semester

Mathematics T2A  
Physics T2  
Physical Chemistry T1  
Electronics T  
Basic Electronics and Practical Measure=  
ment Technique T

Third semester

Physical Chemistry T2 (Theory)  
Statistical Methods T OR Applied Statistics T  
Gas Chromatography T  
Mass Spectrometry T  
Physical Optics and Introduction to Spectra T  
X-Ray Electron and Neutron Diffraction T (Optional)

Training centres

Colleges for Advanced Technical Education.

Vocational service: Nowadays any person with training in some branch of Physics has an extremely rosy future ahead of him as far as job opportunities are concerned, as a result of a virtually constant stream of new discoveries. This course, in which Physics is combined with Chemistry and Physical Chemistry, will lay the foundation for a wide choice among a number of interesting careers for technicians, for example in the service of the CSIR, AEB and UCOR.

See also p.38.

16. PHYSICS : RADIO-ACTIVE ISOTOPES

NATIONAL DIPLOMA FOR TECHNICIANS (PHYSICS : RADIO-ACTIVE ISOTOPES)

Admission qualification: A Standard X Certificate with Mathematics and Physical Science as subjects.

Nature and duration of the course: The course extends over four years and is offered on a full-time, part-time or sandwich basis.

Part A

Chemistry T1  
Physics T1  
Mathematics T

Part B

Basic Electronics and Practical Measurement  
Technique T  
Statistical Methods T

Part A (Continued)

Welding Practice T (non-examination subject)  
Languages TA and TB

Part C

Properties of Matter T  
Physical Optics and Introduction to Spectra T  
Vacuum Technology T1  
Physics T2  
Laboratory Organization and Practice T

Part B (Continued)

Engineering Drawing T1  
Nuclear Physics and Radio-isotopes T OR  
Nuclear Physics T1  
Mathematics T2A

Part D

Vacuum Technology T2  
Advanced Nuclear Physics T OR  
Nuclear Physics T2  
X-Ray Electron and Neutron Diffraction T  
Electronic Measurements T1  
Electronics T (Optional)

Training centre

Pretoria College for Advanced Technical Education.

Vocational service: The Division of Isotopes and Radiation is a division in which nuclear physicists of the Atomic Energy Board at Pelindaba carry out environmental studies on radio-activity and also conduct investigations with the purpose of making radio-isotopes useful to man in, for example, the medical, industrial and agricultural fields, in addition to their present uses.

The work of technicians trained by the Board in this field can be effectively integrated with the activities of nuclear physicists.

See also p. 38.

17. WATER PURIFICATION TECHNOLOGY

NATIONAL DIPLOMA IN WATER PURIFICATION TECHNOLOGY

Admission qualification: A Standard X Certificate, NTC III (N3) or equivalent with Mathematics and a science subject on Std X level.

Nature and duration of the course: The course can be taken on a part-time or full-time basis. The course extends over three years and consists of 18 months' theoretical training at a college for advanced technical education and 18 months' practical in-service training at a water purification plant.

First semester

Public Health Practice T  
Chemistry T1  
Physics T1  
Mathematics T (Lab. Tech.)

Second semester

Water Purification Technology T1  
Languages TB (Candidate's second language)  
Water Analysis T1 (Theory)  
Water Analysis T1 (Practical)  
Microbiology T1 (Theory)  
Microbiology T1 (Practical)

Third semester

Water Purification Technology T2  
Engineering Drawing T1  
Water Purification Biology T  
Water Analysis T2 (Theory)  
Water Analysis T2 (Practical)

Training centres

Colleges for Advanced Technical Education.

Vocational service: An irregular rainfall, limited water resources and the fact that water that has been used for household or industrial purposes is polluted are some of the reasons why South Africa may at some time or other face a serious water shortage. One of the methods that may be applied to remedy this possible shortage is the re-use of water. However, water purification installations must exercise continual quality control to prevent the spreading of disease by contaminated water. For this purpose advanced techniques are used to an increasing extent.

Several organizations are taking an interest in the services of persons with

appropriate qualifications. The National Institute for Water Research of the CSIR, the SABS, the Rand Water Board, municipalities and industries such as Iscor may be approached in this connection.

## H. SURVEYING AND CALCULATION

Admission qualification: A Standard X Certificate or equivalent with Mathematics and at least one of the following subjects: Physical Science, Physics, Chemistry or Mechanics.

Nature and duration of the courses: The courses extend over three years and are offered on a sandwich basis, i.e. three semesters of college attendance and three semesters of practical in-service training in the Government department in which the candidate has been appointed.

### 1. CADASTRAL

#### NATIONAL DIPLOMA FOR TECHNICIANS (CADASTRAL)

##### Subjects

##### First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1  
Candidate's Second Language TB

##### Second semester

Geography (Surveyors)  
Surveying T2  
Cartography I  
Photogrammetry I

##### Third semester

Law I - Surveying  
Law II - Land Registration  
Law III - Township Layout

##### Training centres

Colleges for Advanced Technical Education.

Vocational service: After a surveyor has obtained all the necessary data from the surveyor-general for making surveys and calculations, the data and calculations, together with a map of the piece of land, are handed to the departmental cadastral technician who then examines them and calculates the area of the land. The technician also compiles descriptions of boundaries and supplies information on demand.

Since the duties of cadastral technicians consist mainly of drawing and the calculation of data, the work is generally performed in a well-equipped office and men and women can be considered for appointment. Posts for these technicians exist in the Departments of Agricultural Credit and Land Tenure and Bantu Administration and Development and incumbents are stationed in Pretoria, Cape Town, Pietermaritzburg, Bloemfontein and Windhoek.

See also p. 6 for opportunities for advancement in the Public Service.

### 2. CALCULATION : GEODESY

#### NATIONAL DIPLOMA FOR TECHNICIANS (CALCULATION : GEODESY)

##### Subjects

##### First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1  
Candidate's Second Language TB

##### Second semester

Mathematics (Surveyors) II  
Surveying T2  
Cartography I  
Photogrammetry I

##### Third semester

Surveying T3  
Photogrammetry II

### Training centres

Colleges for Advanced Technical Education.

Vocational service: A calculator (Geodetic) supplies, by means of calculation, the position of a network of beacons according to which cadastral, engineering and map surveys are done. These tasks are mainly performed in an office but there are frequent opportunities for short periods of field-work with a view to the broadening of knowledge and experience. Men as well as women are considered for appointment as calculators and they are employed by the Trigonometrical Division of the Department of Agricultural Credit and Land Tenure at Mowbray (Cape Town) and Windhoek. On attainment of the diploma, the Pupil Calculator is promoted fully fledged calculator. He can then proceed to the posts of Senior Calculator, Chief Calculator and Control Calculator.

See also p. 6 for opportunities for advancement in the Public Service.

### 3. GEOLOGY

#### NATIONAL DIPLOMA FOR TECHNICIANS (GEOLOGY)

##### Subjects

##### First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1  
Candidate's Second Language TB

##### Second semester

Geology T1  
Geophysics (Electric-Magnetic) T  
Mathematics (Surveyors) II  
Principles of Electricity T

##### Third semester

Geology T2  
Geophysics (Gravitation - Seismic) T  
Hydrology I  
Basic Electronics and Practical Techniques of Measurement T

### Training centres

Colleges for Advanced Technical Education.

Vocational service: Since the task of the technician (Geology) in the service of the Geological Survey Division of the Department of Mines entails the locating of mineral deposits and the underground movement of water and the investigation of sites for the building of dams and other engineering projects, it is essentially an open-air occupation. Technicians who are fond of travelling and life in the open air should find this career extremely interesting.

On successful completion of the diploma course, a pupil technician is immediately promoted to the rank of technician.

See also p. 6 for opportunities for advancement in the Public Service.

### 4. HYDROLOGY

#### NATIONAL DIPLOMA FOR TECHNICIANS (HYDROLOGY)

##### Subjects

##### First semester

Mathematics (Surveyors) I  
Drawing I  
Surveying T1  
General Science  
Candidate's Second Language TB

##### Second semester

Geology T1  
Geophysics (Electric-Magnetic) T  
Hydrology T

##### Third semester

Hydrology II  
Mathematics (Surveyors) II  
Surveying T2  
Mechanics and Hydraulics

### Training centres

Colleges for Advanced Technical Education.

Vocational service: Candidates who are interested in this field must apply to the Department of Water Affairs, Pretoria, for appointment as pupil technicians.

Although a technician's task involves a great deal of travelling, most technicians are employed in the head office in Pretoria, which is the home of the Division of Hydrological Research. However, there are regional offices at Howick (Midmar Dam), Cape Town and East London as well. Women, who may also be appointed as technicians, are stationed in Pretoria.

See p.6 for opportunities for advancement in the Public Service.

5. SURVEYING: ENGINEERING

NATIONAL DIPLOMA FOR TECHNICIANS (SURVEYING : ENGINEERING)

Subjects

First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1  
Candidate's Second Language TB

Second semester

Mathematics (Surveyors) II  
Surveying T2  
Mechanics and Hydraulics  
Photogrammetry I

Third semester

Surveying T3  
Elementary Civil Engineering

Training centres

Colleges for Advanced Technical Education.

6. SURVEYING : TOPOGRAPHY

NATIONAL DIPLOMA FOR TECHNICIANS (SURVEYING : TOPOGRAPHY)

Subjects

First semester

Mathematics (Surveyors) I  
General Science  
Drawing I  
Surveying T1  
Candidate's Second Language TB

Second semester

Mathematics (Surveyors) II  
Surveying T2  
Cartography I  
Photogrammetry I

Third semester

Surveying T3  
Photogrammetry II OR Cartography II

Training centres

Colleges for Advanced Technical Education.

Vocational service: Survey work which can either be concentrated upon engineering work or can be of a topographical nature, forms the basis of all kinds of physical planning and development projects, such as the building of dams, roads, bridges, railways, airports, agricultural works, tunnels, etc. It is thus the task of the Survey Official (Engineering) to collect and describe data, record them on a map or contour plan and make them available to the engineer. When the construction begins, the survey official must ensure that everything goes according to plan. Posts for these technicians exist in the Departments of Agricultural Technical Services, Bantu Administration and Development and Water Affairs, as well as in the Administrations of the Cape Province, Natal, the Orange Free State, the Transvaal and South-West Africa.

The work of a Survey Official (Topographical) consists of triangulation, traversing, levelling, the checking of aerial photographs for mapping purposes, the recording of topographical features of the terrain on aerial photographs and the compilation of detailed topographical maps. Technicians (Topography) are employed, for example, by the Departments of Agricultural Credit and Land Tenure, Bantu Administration and Development, Community Development, Agricultural Technical Services and Transport.

Although maps are prepared in offices, an official must sometimes be away from home

and camp in the veld. All the necessary instruments and apparatus are provided by the State.

The ranks to which one can proceed are as follows: Survey Officer, Senior Survey Officer, Chief Survey Officer and Control Survey Officer.

See also p.6 for opportunities for advancement in the Public Service.

## I. TELECOMMUNICATION - POST OFFICE

### NATIONAL DIPLOMAS FOR TECHNICIANS IN TELECOMMUNICATIONS

Admission qualifications: For entry to the National Diploma for Technicians in either the electrical or mechanical direction a candidate must be at least 16 years of age or produce evidence that he is exempted from further compulsory schooling and have attained a Standard X Certificate or equivalent with Mathematics and Physical Science (or equivalent subjects). He must either have obtained passes in Mathematics and Physical Science equivalent to a D symbol in one subject and an E symbol in the other, or he must hold a Standard X Certificate (Matriculation Exemption) with Mathematics and/or Physical Science (or their equivalents).

Nature and duration of the courses: Each course comprises 6 attendances at approved educational institutions, each attendance being one trimester in duration. These attendances are interspersed with periods of field training to make up a total of four years' training.

The Witwatersrand College for Advanced Technical Education conducts correspondence courses.

#### 1. TELECOMMUNICATIONS : ELECTRICAL

##### NATIONAL DIPLOMA FOR TECHNICIANS (TELECOMMUNICATIONS : ELECTRICAL)

Note: A candidate qualifies for a National Certificate for Technicians (Telecommunications : Electrical) if he/she obtains at least 50% in each of the subjects marked with an asterisk and one of the remaining T3 subjects and has completed a minimum training period of 3 years, comprising his/her course attendances and on-the-job training.

The candidate may eventually qualify for the National Diploma for Technicians (Telecommunications : Electrical) by passing - with a mark of at least 50% - the other prescribed subjects through further study and completing a minimum training period of 4 years, comprising his/her course attendances and on-the-job training.

Should a candidate attain at least 40% in each of the subjects marked with an asterisk and in one of the remaining T3 subjects and have completed a minimum training period of three years, comprising his/her course attendances and on-the-job training, he/she qualifies for a National Certificate for Technicians (Telecommunications). These candidates may qualify to continue with the National Diploma for Technicians (Telecommunications : Electrical) by obtaining a pass mark of at least 50% in all the subjects specified for the National Certificate for Technicians (Telecommunications).

##### First trimester

\*Mathematics T1  
\*Telecommunication Principles T1  
\*Principles of Electricity T1  
\*Basic Telecommunications T1  
General Studies T1

##### Third trimester

\*Radio Communications (telecom) T2  
\*Telegraphy T2  
\*Line Transmission T2  
\*Telephony T2

##### Second trimester

\*Mathematics T2  
\*Telecommunication Principles T2  
\*Logic Techniques T2  
\*Physics B T1  
General Studies T2

##### Fourth trimester

Logic Techniques T3  
\*Telegraphy T3  
\*Line Transmission T3  
\*Telephony T3

Fifth trimester

Radio Communications (telecom) T3  
Mathematics T3  
Line Plant T4  
Telephony T4

Sixth trimester

Video Transmission T4  
Telegraphy T4  
Electrical Measurements (telecom) T4  
Line Transmission T4

Training centres

Colleges for Advanced Technical Education and the Post Office College.

2. TELECOMMUNICATIONS : MECHANICAL

NATIONAL DIPLOMA FOR TECHNICIANS (TELECOMMUNICATIONS : MECHANICAL)

Note: A candidate qualifies for a National Certificate for Technicians (Telecommunications : Mechanical) if he/she obtains at least 50% in each of the subjects of the first to fourth trimesters and has completed a minimum training period of 3 years, comprising his/her course attendances and on-the-job training.

The candidate may eventually qualify for the National Diploma for Technicians (Telecommunications : Mechanical) by passing - with a mark of at least 50% - the other prescribed subjects through further study and completing a minimum training period of 4 years, comprising his/her course attendances and on-the-job training.

Should a candidate attain at least 40% in each of the subjects of the first to fourth trimesters and have completed a minimum training period of three years, comprising his/her course attendances and on-the-job training, he/she qualifies for a National Certificate for Technicians (Telecommunications). These candidates may qualify to continue with the National Diploma for Technicians (Telecommunications : Mechanical) by obtaining a pass mark of at least 50% in all the subjects specified for the National Certificate for Technicians (Telecommunications).

First trimester

Mathematics T1  
Principles of Electricity T1  
Basic Telecommunications T1  
Engineering Drawing T1  
General Studies T1

Second trimester

Mathematics T2  
Physics B T1  
Engineering Drawing T2  
Applied Mechanics T1  
General Studies T2

Third trimester

Physics B T2  
Principles of Electricity T2  
Hydraulics T3  
Applied Mechanics T2

Fourth trimester

Mathematics T3  
Strength of Materials T3  
Mechanics of Machines T3  
Applied Thermodynamics T3

Fifth trimester

Strength of Materials T4  
Mechanics of Machines T4  
Engineering Graphics T3 OR  
Jig and Tool Design T3  
Machine Design T3  
General Studies T3

Sixth trimester

Applied Thermodynamics T4  
Electrotechnology T3  
Hydraulics T4  
Machine Design T4

Training centres

Colleges for Advanced Technical Education.

NATIONAL CERTIFICATES FOR TECHNICIANS IN TELECOMMUNICATIONS

Admission qualifications: To qualify for entry to the National Certificate for Technicians in Telecommunications an applicant must be at least 16 years of age or produce evidence that he is exempted from further compulsory schooling and have attained the educational qualifications prescribed below:

- (i) A Standard X Certificate with pass marks in Mathematics and/or Physical Science (or their equivalents); or
- (ii) a Standard X Certificate with Mathematics and Physical Science (or their



equivalents) at Standard VIII level at least; or

(iii) a Standard VIII Certificate plus Mathematics and Physical Science (or their equivalents) at Standard X level.

In the case of an immigrant or a person in possession of N3 or equivalent qualification, it is left to the head of a college to judge whether such a person has adequate knowledge to make a success of the course and then to register him/her directly for the first, second or third part of the course.

Nature and duration of the courses: Each course consists of 4 attendances at approved educational institutions, each attendance being one trimester in duration. These attendances are interspersed with periods of on-the-job training to make up a total of 3 years' training.

### 1. AUTOMATIC EXCHANGES

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : AUTOMATIC EXCHANGES)

#### First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

#### Second trimester

Trunk Line Transmission T2  
Telecommunication Principles T1  
Automatic Switching (British) T2  
Automatic Switching (German) T2

#### Third trimester

Logic Techniques T2  
Telecommunication Principles T2  
Automatic Exchanges (British) T2  
Automatic Exchanges (German) T2

#### Fourth trimester

Logic Techniques T3  
Private Automatic Branch Exchanges T3  
Automatic Exchanges (British) T3  
Automatic Exchanges (German) T3

### 2. CARRIERS

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : CARRIERS)

#### First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

#### Second trimester

Trunk Line Transmission T2  
Telecommunication Principles T1  
Carrier Systems T2  
Telegraphy Transmission T2

#### Third trimester

Logic Techniques T2  
Telecommunication Principles T2  
Carrier Systems (Open Wire) T2  
Microwave Transmission T2

#### Fourth trimester

Logic Techniques T3  
Video Transmission T4  
Carrier Systems (Cable) T3  
Microwave Transmission T3

### 3. DRAWING OFFICE

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : DRAWING OFFICE)

#### First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

#### Second trimester

Workshop Technology (l.c.) T1  
Automatic Switching (British) T2  
Telecommunication Principles T1  
Drawing Office Practice T2

Third trimester

Workshop Technology (1.c.) T2  
Machining T2  
Engineering Drawing T2  
Toolmaking T2

Fourth trimester

Workshop Technology (1.c.) T3  
Line Plant T4  
Machining T3  
Drawing Office Practice T3

4. OUTDOOR PLANT

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : OUTDOOR PLANT)

First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

Second trimester

Trunk Line Transmission T2  
Telecommunication Principles T1  
Telegraph Transmission T2  
Lines T2

Third trimester

Logic Techniques T2  
Telecommunication Principles T2  
Subscriber's Plant T2  
Telephony T2

Fourth trimester

Logic Techniques T3  
Networks T3  
Subscriber's Plant T3  
Lines T3

5. RADIO

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : RADIO)

First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

Second trimester

Radio Systems T2  
Telecommunication Principles T1  
Telegraph Transmission T2  
Trunk Line Transmission T2

Third trimester

Logic Techniques T2  
Telecommunication Principles T2  
Radio Transmission T2  
Microwave Transmission T2

Fourth trimester

Logic Techniques T3  
Radio Transmitters T3  
Radio Systems T3  
Radio Receivers T3

6. TELEGRAPHY

NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : TELEGRAPHY)

First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

Second trimester

Telegraph Exchanges T2  
Telecommunication Principles T1  
Telegraph Transmission T2  
Telegraph Mechanisms T2

Third trimester

Logic Techniques T2  
Telecommunication Principles T2  
Carrier Systems T2  
Telegraph Machines T2

Fourth trimester

Logic Techniques T3  
Telegraph Communication Systems T3  
Telegraph Exchanges T3  
Telegraph Machines T3

## 7. WORKSHOPS

### NATIONAL CERTIFICATE FOR TECHNICIANS (TELECOMMUNICATIONS : WORKSHOPS)

#### First trimester

Telecommunication Science T1 OR  
Mathematics T1  
Principles of Electricity T1 OR  
Principles of Electricity  
(telecom) T1  
Basic Telecommunications T1  
Engineering Drawing T1

#### Second trimester

Workshop Technology (l.c.) T1  
Telecommunication Principles T1  
Welding (telecom) T2  
Mechanical Aids T2

#### Third trimester

Engineering Drawing T2  
Workshop Technology (l.c.) T2  
Machining T2  
Toolmaking T2

#### Fourth trimester

Mechanical Aids T3  
Equipment Overhaul T3  
Machining T3  
Workshop Technology (l.c.) T2

#### Training centres

Colleges for Advanced Technical Education, the Post Office College and some Technical Colleges.  
The Witwatersrand College for Advanced Technical Education conducts correspondence courses.

Vocational service: Some of the duties of technicians in the service of the Post Office are briefly the following: The installation and maintenance of all telecommunication equipment in the Post Office, such as automatic telephone exchanges, electronic equipment for carrier and microwave links in the larger centres, the radio stations that link South Africa with other countries, subscribers' lines, telephones, switchboards, and private branch exchanges. Technicians also build overhead and underground telephone lines and perform mechanical duties in workshops.

Pupil technicians are classified for training in the type of work for which they reveal an aptitude, and preferences for a particular type of work are taken into consideration as far as possible. Female pupil technicians are classified for indoor work of a less strenuous nature.

The acute shortage of technicians also affects the Post Office and the prospects of promotion are consequently extremely favourable. The first promotion occurs after the pupil has successfully completed his period of training. Promotion is then gained according to merit and supervisory and executive posts are within reach of hard-working and ambitious persons. Technicians are constantly encouraged to further their studies and a Post Office bursary scheme even provides for full-time study at a university.

The Post Office also employs persons who are interested in being trained as telephone electricians or technical assistants who do work of a less technical nature than that of the technicians. Such persons must be in possession of at least a Standard VIII Certificate. Those with a Standard X Certificate receive preference, however, as well as higher salaries.

## J. O T H E R C O U R S E S

### 1. BUILDING INSPECTORS

#### NATIONAL CERTIFICATE FOR BUILDING INSPECTORS

Admission qualifications: A Standard X Certificate or equivalent. Eligible candidates in possession of a Standard VIII Certificate or N.T.C. III (Building), will also be considered for admission.

Note: For a transitional period up to the end of 1980, candidates with at least five years' experience as Building Inspectors will be admitted to the course without having to comply with the above requirements.

Nature and duration of the course: The theoretical part of the course extends over two trimesters. Evidence should also be produced of

- (a) a further period of two years and four months of practical in-service training if the course is followed on a full-time basis, OR
- (b) a further period of at least three years of practical in-service training if the course is followed on a part-time basis or through correspondence.

For a transitional period up to the end of 1980, candidates admitted to the course with at least 5 years' experience as a Building Inspector at the time of admission to the course, will be deemed to have satisfied requirements (a) and (b) above.

#### Subjects

##### First trimester

Building Construction T1  
 Building Materials  
 Building Inspection, Regulations and Administration T1  
 General Studies T1

##### Second trimester

Building Construction BT2  
 Building Materials BT2  
 Drainage and Sanitation T3  
 Building Plans: Interpretation, Control and Valuation BT2

#### Training centres

Colleges for Advanced Technical Education  
 Some Technical Colleges.

Vocational service: Building Inspectors are mainly employed by larger and smaller municipalities with a view to inspection work on the site where residences and other buildings are being erected. There are, however, construction companies and builders who also make use of the services of these persons.

## 2. BUILDING SURVEYORS

### NATIONAL DIPLOMA FOR BUILDING SURVEYORS

Admission qualifications: As for the fields in engineering, p.25.

Nature and duration of the course: As for the fields in engineering, p.25, i.e. six trimesters (2 years) of college attendance and two years of practical in-service training.

#### First trimester

Building Construction T1  
 Building Calculations T1  
 Draughtsmanship (Building) T1  
 General Studies T1

#### Second trimester

Building Administration and Organisation T1  
 Building Materials T1  
 Building Calculations T2  
 General Studies T2

#### Third trimester

Building Construction T2  
 Building Administration and Organisation T2  
 Building Materials T2  
 Measurement of Building Work T3

#### Fourth trimester

Building Administration and Organisation T3  
 Building Materials T3  
 Quantity Surveying T3  
 Estimating and Pricing (Builders) T3

#### Fifth trimester

Building Construction T3  
 Building Specifications T3  
 Quantity Surveying T4  
 Estimating and Pricing (Builders) T4

#### Sixth trimester

Quantity Surveying (Additional) T4  
 Estimating and Pricing (Additional) T4  
 Financial Planning and Cost Control T4  
 Building Construction T4

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: In the building trade the relationship between the building surveyor and the builder is about the same as that between the technician and the engineer. Building surveyors are mainly employed by the larger construction firms with a view to physical survey work on the building site.

## 3. CONSTRUCTION SUPERVISORS

### NATIONAL DIPLOMA FOR CONSTRUCTION SUPERVISORS

Admission qualification: As for the fields in engineering, p.25.

Nature and duration of the course: The minimum period of training in which the full

diploma can be obtained in three years and eight months, i.e. five trimesters of college attendance and two years of in-service training.

An Intermediate Diploma will be issued by the college after attendance at the college for three trimesters and after the prescribed T1 and T2 subjects have been passed and written proof of one year's appropriate in-service training has been submitted.

#### First trimester

Building Construction T1  
Science for Builders T1  
Building Calculations T1  
Draughtsmanship (Building) T1  
General Studies T1

#### Second trimester

Building Materials T1  
Science for Builders T2  
Building Calculations T2  
Building Administration and Organization T1  
General Studies T2

#### Third trimester

Building Construction T2  
Building Materials T2  
Measurement of Building Works T3  
Building Administration and Organization T2  
Building Specifications T3

#### Fourth trimester

Building Construction T3  
Quantity Surveying T3  
Estimating and Pricing (Builders) T3  
Building Administration and Organization T3

#### Fifth trimester

Building Construction T4  
Estimating and Pricing (Builders) T4  
Quantity Surveying T4 OR Science for Builders T3

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: The building industry has discovered that the function of a construction supervisor is an extremely important one. He constitutes the most important link between the management and the site personnel and he must ensure that planning, administration and the execution of tasks are properly co-ordinated. The student enters the service of an employer in the building industry and is then in the privileged position of receiving a salary while studying.

The demand for the services of trained manpower in the building industry is showing a tendency to increase as a result of enormous expansion. An increasing number of construction supervisors are consequently also needed. The occupation is, in addition, financially remunerative and affords personal satisfaction.

More information can be obtained from the Federation of Building Industries (SA), P.O. Box 11359, Johannesburg 2000.

#### 4. DRESSMAKING AND PATTERNMAKING

NATIONAL CERTIFICATE IN DRESSMAKING AND PATTERNMAKING

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over one year of full-time study or two years of part-time study.

#### Subjects

##### Clothing Construction and raw-materials (theory)

Textile fibres and fabrics  
Fashion and design  
Principles and processes of garment construction

##### Workroom Equipment, Layout and Administration

Workroom equipment  
Workroom layout  
Workroom management

## Business Practice

### Clothing Construction (practical)

Patternmaking  
Practical garment construction  
Completed work

### Non-examination subject

Department and Physical Recreation

### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Technical Institutes.

Vocational service: This course offers training in cutting patterns and constructing garments from natural and artificial fabrics. It provides opportunities for ladies who wish to be trained as dressmakers or managers of small workshops or boutiques specializing in clothes. They may, however, also be employed by clothing factories, dress designers or the clothes departments of large stores.

## 5. FILM PRODUCTION

### NATIONAL CERTIFICATE FOR FILM PRODUCTION TECHNICIANS

Admission qualification: The minimum academic qualification for admission to the course is either a Standard X Certificate, an NTC III (N3) or an equivalent qualification.

Nature and duration of the course: The full-time course extends over one year, i.e. two semesters of approximately eighteen weeks each. The part-time course extends over two years, i.e. four semesters of approximately eighteen weeks each. In both cases the theoretical parts of the course are offered by the Pretoria College for Advanced Technical Education.

N.B.: The award of the certificate depends on -

- the successful completion of all the subjects in Parts A and B
- the successful participation in the production of a short film, otherwise successful completion of the subject Practical Film Production T; this will be an application of all the knowledge acquired during the course, from the writing of the scenario, photography, editing, processing and finally the showing of the motion picture
- a year's appropriate practical experience in the film industry certified by the employer.

In the case of part-time candidates who worked full-time in the film industry for a year during their course, that year will be regarded as appropriate practical experience; other persons will still have to undergo a year's practical experience upon successful completion of Parts A and B.

### Subjects

#### Part A

Film Science T  
Film History T  
Camera Work, Sound and Lighting T1  
Television Apparatus T  
Film Directing T1  
Film Editing and Scriptwriting T1

#### Part B

Film Art T  
Projection T  
Production Management T  
Camera Work, Sound and Lighting T2  
Film Directing T2  
Film Editing and Scriptwriting T2  
Practical Film Production T

Vocational service: The film industry in South Africa has made great progress in recent years as regards the quantity as well as the quality of production and is apparently becoming one of the most promising industries in the country.

The success of a film production does not depend on the actors only. There is also the important function of artists, technicians and many other persons. For this

reason there are many interesting occupations in the industry. Persons who are usually actively involved in the making of a film are, for instance, the following: The script writer, the actors, the producer, the camera-man and assistant camera-man, the technical producer, the sound technicians, the production manager, the photographer, the persons in charge of the editing and the persons responsible for the continuity, make-up and costumes, music, laboratory work, etc.

The course for film production technicians provides thorough background knowledge in most of these fields, but the training will only be rounded off after considerable practical experience has been gained. For young men and women who are interested, who work hard, improve their qualifications and have some ambition, the film industry offers an interesting, satisfying and exciting career.

In the Department of Information a trained person is appointed as Camera-man or Pupil Camera-man according to relevant experience. From here he can be promoted to the rank of Director Camera-man.

## 6. FIRE TECHNOLOGY

### NATIONAL DIPLOMA IN FIRE TECHNOLOGY

#### Admission qualifications

- (a) A Standard X Certificate or equivalent or NIII, with Mathematics and Physical Science as subjects;
- (b) The Fireman's Examination of the SA Fire Services Institute.

All candidates must also be selected by the SA Fire Services Institute.

Nature and duration of the course: The course extends over three years and is offered on a sandwich basis, i.e. three semesters of college attendance alternated by three semesters of practical in-service training in collaboration with the Pretoria Fire Station.

#### First semester

Mathematics T  
Chemistry for Fire Technology T1  
Fire Technology T1  
Applied Hydraulics T1

#### Second semester

Chemistry for Fire Technology T2  
Physics T1  
Applied Hydraulics T2  
Fire Technology T2  
Communication in Fire Technology T

#### Third semester

Chemistry for Fire Technology T3  
Physics for Fire Technology T  
Fire Technology T3  
Applied Hydraulics T3  
Management of Fire Stations T

#### Training centre

Pretoria College for Advanced Technical Education.

Vocational service: This course supplies purposeful training to persons in the employ of fire stations of municipalities. It includes training in the prevention of fire, applied knowledge of hydraulics to enable firemen to operate and repair equipment, and the principles of management of a fire station.

## 7. HOME ECONOMICS

PROFICIENCY CERTIFICATE;  
NATIONAL CERTIFICATE FOR COMMERCIAL DEMONSTRATORS and  
NATIONAL DIPLOMA IN HOME ECONOMICS

Admission qualifications: A Standard X Certificate or equivalent. A medical certificate must accompany the entrance application and candidates will be selected by the training college.

Nature and duration of the course: The course extends over three years of full-time study. Upon successful completion of the first year, the college will award a Proficiency Certificate; after the second year the National Certificate for Commercial Demonstrators will be awarded and after the third year the National Diploma in Home Economics.

First year

Clothing I	<u>Compulsory non-examination subjects</u>
Food and Nutrition	Flower Arrangement and Floristry OR
Care of Textiles	Art Needlework
Home-making	Physical Education
Afrikaans A or B	Speech Training and Deportment
English A or B	Aids for Demonstrations
Physiology for Home Economics	First Aid and Home Nursing
Typewriting I	

Second year

Clothing II	<u>Compulsory non-examination subjects</u>
Food and Nutrition II	Cake Icing
Home-making (cont.)	Physical Education
Afrikaans A or B	
English A or B	
Method of Demonstration I	
Psychology for Home Economics I	
Typewriting I	
Applied Science I (Home Economics)*	

Third year

Clothing III	<u>Compulsory non-examination subjects</u>
Food and Nutrition III	Millinery
Method of Demonstration II	Physical Education
Psychology for Home Economics II	
Business Practice	
Applied Science II (Home Economics)	

Note:

- (a) \*The subject Applied Science I (Home Economics) is optional for candidates doing the course for the National Certificate for Commercial Demonstrators. The subject is compulsory for the National Diploma in Home Economics.
- (b) Both official languages must be taken in the course, and at least one must be on the higher grade. The second language may be examined either internally or externally. Final examinations in the official languages may be taken only at the end of the second year.
- (c) Typewriting I for beginners may conveniently be spread over two years.

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: The general purpose of the training in Home Economics is to raise the standard of home-making. Home-making enjoys the status of a fully fledged profession and the woman should be made aware of her role in creating a pleasant home for her family through economical use of time, money and energy. The training thus prepares young ladies for a pleasant and promising career and at the same time equips them with scientific knowledge for their role as future housewives.

Trained candidates are eligible to work, for example, as liaison between manufacturer and consumer as regards various household requirements; in the service of firms concerned with the manufacture of clothing, foodstuffs, furniture and with interior decoration; in the service of boards of control such as those concerned with meat, wool, milk, wheat, maize, dairy products, eggs, dry beans, and citrus.



During the course students are also given the opportunity to attend practical demonstrations. They give demonstrations themselves to which members of the public and representatives of firms are invited. In this way the necessary knowledge and technological skill are acquired to be successful as commercial demonstrators. Such persons are, as in the case of home economists, employed to publicize specific products, e.g. knitting machines, foodstuffs and kitchen and other equipment.

## 8. HORTICULTURE

### NATIONAL DIPLOMA IN HORTICULTURE

Admission qualification: Candidates must be in possession of a Standard X Certificate or equivalent, or the National Certificate in Horticulture (NTC III Horticulture).

Nature and duration of the course: The course extends over three years on a sandwich basis or eighteen months' full-time college training and eighteen months' practical experience with an approved employer.

#### First semester

Horticulture T1  
Landscape Planning T1  
Plant Morphology T  
Climatology T  
Horticulture Science T  
Entomology T

#### Second semester

Horticulture T2  
Landscape Planning T2  
Plant Physiology T  
Genetics T  
Insect Control T  
Soil Science T  
Afrikaans TA or TB (One language on the higher grade)

#### Third semester

Horticulture T3  
Landscape Planning T3  
Plant Taxonomy T  
Plant Pathology T  
Plant Cultivation T  
Ecology T  
English TA or TB (One language on the higher grade)

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: This course caters for persons in the service of the private sector and municipalities, but it is also taken by learner technicians in the Department of Agricultural Technical Services (see p. 11). They are also employed with a view to training by the Department of Public Works, the four provincial administrations and the Administration of South-West Africa. In these cases the work of the horticulturist mainly entails the development, maintenance and administration of formal gardens, parks, sports fields etc. After being promoted Superintendent of Gardens deserving persons may progress to the ranks of Senior, Head and Control Superintendent of Gardens.

See also p.6 for promotion possibilities in the Public Service.

## 9. INDUSTRIAL TRAINING OFFICERS

### NATIONAL CERTIFICATE FOR INDUSTRIAL TRAINING OFFICERS

Admission qualification: A Standard X or NTC III Certificate or equivalent. Other persons who, in the discretion of the director of the training college, comply with the requirements, may also be admitted.

Nature and duration of the course: The course extends over one trimester of full-time college attendance or one year on a part-time basis.

#### Subjects

Communication  
Instruction Aids  
Psychology for Industrial Training

Organisation and Administration of Training  
Methods of Instruction  
Safety Training Course  
Presentation and Evaluation of Instruction

### Training centres

Colleges for Advanced Technical Education.

Vocational service: This course provides for the training of suitable persons to enable them to undertake the effective in-service training of other employees in industry. Some of the bodies already making use of the services of these officers are Iscor, the AEB and Atlas Aircraft Corporation.

## 10. INSPECTORS OF WORKS (BUILDING)

NATIONAL CERTIFICATE FOR INSPECTORS OF WORKS (BUILDING)

Admission qualification: As for the fields in engineering, p. 25.

Nature and duration of the course: The course consists of three trimesters of theoretical training (approximately one year) and one year of practical training. The whole course thus takes two years.

### Part I

Building Construction T1  
Building Materials T1  
Building Administration and Organization  
T1  
Building Calculations T1 OR Science  
for Builders

### Part II

Building Construction T2  
Building Materials T2  
Building Administration and  
Organization T2  
Drainage and Sanitation T3

### Part III

Building Specifications T3  
Costing and Valuations T3  
Measurement of Building Works T3  
Building Construction T3

### Training centres

Colleges for Advanced Technical Education.

Vocational service: Inspectors of Works are employed in supervisory and controlling capacities to ensure that building operations are carried out according to constructional requirements, plans and specifications. The duties are divergent and sometimes of a confidential nature and demand a high degree of independence, sense of responsibility and sound judgment. It is an ideal occupation for a young man with the necessary qualifications and interest who would like to spend much of his working time outside his office.

Inspectors of Works are employed by the Government departments of Public Works, Coloured, Rehoboth and Nama Relations, Defence, Water Affairs, Forestry, Bantu Administration and Development, Bantu Education and Community Development; the four provincial administrations and the Administration of South-West Africa. All large municipalities also make use of their services.

## 11. NATURE CONSERVATION AND MANAGEMENT

NATIONAL DIPLOMA IN NATURE CONSERVATION AND MANAGEMENT

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years, calculated from the date of registration at a college for advanced technical education.

- (a) Full-time study: Eighteen months of college attendance and eighteen months of practical in-service training.
- (b) Study through correspondence: Correspondence students have to supplement their lectures by means of college attendance during each year of the course for two successive weeks during the first half of the year and for three successive weeks during the second half of the year.

## Subjects

### Part A: (First year)

Nature Conservation Ecology T1  
Animal Studies T  
Plant Studies T  
Basic Public Administration T

### Part B: (Second year)

Nature Conservation Ecology T2  
Administration of Law (Nature  
Conservation) T  
Land Use (Nature Conservation) T  
Mammalian Anatomy T

### Part C: (Third year)

Nature Conservation Ecology T3  
Nature Conservation Techniques T  
Fishery Management T  
Extension and Communication T  
Game Farm Management T

## Training centres

Colleges for Advanced Technical Education

Correspondence: Witwatersrand College for Advanced Technical Education  
(External Studies).

Vocational service: Persons employed by organizations concerned with the conservation and reclamation of the country's fauna and flora can be roughly divided into two groups, namely professional officers and technicians. The technicians assist the professional officers by doing most of the routine work. They are responsible for most of the daily practical work.

The organizations which employ professional officers and technicians on an organised basis are the following:

The Government departments of Water Affairs (Division of Water Research), Industries (Division Sea Fisheries), Agricultural Technical Services (Division Soil Protection/National Herbarium) and Forestry; the departments of Nature Conservation of the provincial administrations and South-West Africa; the National Parks Board; the Oceanographic Research Institute, Durban; the CSIR; the Natal Herbarium, Durban; the Moss Herbarium, University of the Witwatersrand; the Compton Herbarium, Newlands, Cape; the Bolus Herbarium, University of Cape Town and a number of museums scattered throughout the country.

## 12. PARKS AND RECREATION ADMINISTRATION

NATIONAL DIPLOMA IN PARKS AND RECREATION ADMINISTRATION

Admission qualification: The admission qualification to the course is the National Technical Certificate Part III in Horticulture or a Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over two years on a part-time basis.

### Group I

Two courses in each of the following four subjects:  
Administration I, II  
Architecture and Town Planning I, II  
Landscape Architecture I, II  
Recreation and Physical Education I, II

### Group II

One course in each of the following four subjects:  
Art  
Arboriculture  
Crematorium and Cemetery Administration  
Costing, Accounting and Control

## Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: The hanging gardens of Babylon in Persia are one of the many examples which prove that man has, through the centuries, been interested in improving and beautifying his environment. Today, time and labour, sometimes at great expense, are also devoted to this important aspect and the demand, particularly for planners in this field, is increasing at a rapid tempo.

Although this course is based on horticulture, it is not concentrated upon the general study of the task of an ordinary horticulturist. It is much more extensive and the stress shifts, inter alia, to a study of the functional effectiveness of parks, recreation grounds and facilities, etc. and their situation in a architectural and aesthetic perspective.

The course is offered on a part-time basis, which means that candidates may be employed by the parks and recreation division of an organization during their training. Institutions which employ persons with these qualifications are, for example, municipalities, landscape architects, the Railways, the Provincial Administrations and the Department of Public Works.

### 13. PROCESSING OF TEXTILE MATERIALS

#### (i) KNITTING

##### NATIONAL CERTIFICATE FOR TECHNICIANS (KNITTING)

Admission qualification: As for the fields in engineering, p. 25.

Nature and duration of the course: The course extends over three years, i.e. three trimesters of college attendance and two years of in-service training.

##### First trimester

Textile Materials and Processes T1  
Textile Testing, Calculations and Statistics T1  
Principles of Electricity T1  
Engineering Drawing T1

##### Second trimester

Principles of Knitting T2  
Textile Testing, Calculations and Statistics T2  
Applied Technology (M) T1  
Textile Electronics T2

##### Third trimester

Principles of Knitting T3  
Cloth Structure and Design (Knitting) T3  
Knitwear Manufacture T3  
Textile Factory Management T3

#### (ii) SPINNING

##### NATIONAL CERTIFICATE FOR TECHNICIANS (SPINNING)

Admission qualification: As for the fields in engineering, p. 25.

Nature and duration of the course: The course extends over three years, i.e. three trimesters of college attendance and two years of in-service training.

##### First trimester

Textile Materials and Processes T1  
Textile Testing, Calculations and Statistics T1  
Principles of Electricity T1  
Engineering Drawing T1

##### Second trimester

Principles of Spinning T2  
Textile Testing, Calculations and Statistics T2  
Applied Technology (M) T1  
Textile Electronics T2

##### Third trimester

Principles of Spinning T3  
Cloth Structure and Design (Spinning) T3  
Processes related to Spinning T3  
Textile Factory Management T3

#### (iii) WEAVING

##### NATIONAL CERTIFICATE FOR TECHNICIANS (WEAVING)

Admission qualification: As for the fields in engineering, p. 25.

Nature and duration of the course: The course extends over three years, i.e. three trimesters of college attendance and two years of in-service training.

##### First trimester

Textile Materials and Processes T1

##### Second trimester

Principles of Weaving T2

First trimester (continued)

Textile Testing, Calculations and  
Statistics T1  
Principles of Electricity T1  
Engineering Drawing T1

Second trimester (continued)

Textile Testing, Calculations and  
Statistics T2  
Applied Technology (M) T1  
Cloth Finishing and Making Up T2

Third trimester

Principles of Weaving T3  
Principles of Knitting T3  
Cloth Structure, Analysis and Design (Weaving) T3  
Textile Factory Management T3

Training centre

East London Technical College.

Vocational service: In South Africa the textile industry, one of the youngest industries, will in the years to come be an important source of employment. The prospects are obvious. Persons trained in knitting, spinning and weaving are in great demand, and are mainly employed by textile factories. Those who produce work of good quality may progress to the highest ranks in the manufacturing sector.

CHAPTER III  
COMMERCE, ADMINISTRATION AND  
RELATED FIELDS

A. GENERAL INFORMATION

Variety of fields

The choice of a suitable field in commerce, administration or one of the related fields is largely based on the knowledge of all the most important facets of that particular field. However, it is not the intention, nor is it possible to discuss all possible aspects of each field in detail in this book. For this reason, a general picture is presented of a number of fields by means of examples.

Field of marketing: One of the requirements for the success of a business undertaking is a good turnover. The rise of marketing as one of the managerial functions can be attributed to a new and more scientific approach to all aspects of salesmanship (marketing).

The business world's acceptance of the value of effective marketing today creates increasing opportunities for employment in its various fields of specialization such as those of sales, advertising, public liaison, market research, commercial art, fixing of prices, distribution, sales promotion, post-sales service, etc. Qualified persons who have gradually gained the required experience, who are ambitious and possess other essential characteristics can, by pursuing a career in this field, advance to the highest posts in the managerial sphere.

Managerial field: The task of providing guidance and of controlling and co-ordinating the work of a large group of employees with a view to maximum economic results, demands the highest qualities of leadership. The managerial profession does not only include general managers but also specialists in the large number of managerial functions which are so characteristic of commerce and industry. In order to fulfil these functions, thorough training in modern principles and practice is absolutely essential.

The large variety of managerial fields provides persons with the opportunity of choosing a suitable field in accordance with their aptitude and personality characteristics such as temperament, etc. A few of these fields are, for example, those of the personnel manager, sales manager, executive manager, production or works manager, marketing manager, financial manager, credit manager and so forth.

Electronic Data Processing and System Analysis: The electronic computer can handle data of a divergent nature, intricate calculations and the processing of a large volume of data within a short space of time, although it does not possess individual initiative. The computer would serve no purpose if it were not for the part played by man in the form of instructions, i.e. the programme.

The average computer requires the services of three groups of personnel, viz the system analysts, programmers and computer operators. There is a constant growth in the number of organizations which make use of computer facilities. The result is that the demand for qualified personnel still exceeds the supply. It is consequently possible to advance rapidly to the managerial level in one or more fields of computer science, and to earn a highly competitive salary.

Field of accountancy: The accountancy profession plays an indispensable part in all types of business undertakings. In the course of time, the qualified accountant has risen from the position of ordinary bookkeeper and auditor to that of the specialized leader and financial adviser. The ambitious and able accountant has the opportunity of building up a flourishing practice or, for example, of obtaining a position as managerial adviser, financial controller or director of companies. The accountant is highly respected and there is every possibility that he can advance to senior positions of responsibility.

Particular mention must be made of the rôle of the cost accountant in the rapidly developing industrial sector of the country. His knowledge is utilized by virtually all undertakings, large or small, in divisions such as cost accounting, budget control, labour remuneration, fixing of prices, managerial guidance and

many other spheres in which the analysis of and control over expenditure are necessary. He is thus a key figure in the determination of development and efficiency, particularly when an undertaking finds itself in a highly competitive position. The advice and responsible calculations of the cost accountant are of great importance to the management of an undertaking in particular, and this accounts for his high salary.

Secretarial field: The higher ranks in the secretarial profession are mainly accessible to those persons who possess recognized professional qualifications and who have acquired membership of the secretarial organizations. Every company, for example, must appoint a secretary and this person occupies an extremely responsible position as chief administrative and executive officer. With his specialized knowledge of the Companies Act, he is an important member of the managerial team and he is generally also appointed as director.

Apart from his other duties, the secretary is an important link between the directors on the one hand, and, for example, the shareholders, office personnel, bankers, auditors and the public on the other. This function ensures that his work is interesting and pleasant. He must be able to handle important matters intelligently and responsibly. His status is high and he is adequately remunerated.

As a result of the growth of industrial organizations, the annual registration of a large number of new companies and the tendency towards the forming of groups of companies, the secretary, with this specialized training, has a dynamic function to fulfil in the business world of today.

#### Combination of courses

When a student is enrolled for one course, it is often possible for him/her to write the examination in subjects of another Professional Institute or for another National Diploma with little, if any additional effort. Subjects in one course often correspond with subjects in another. The knowledge of a person taking Accountancy for the C.I.S. for example, will be sufficient for him to pass in Financial Accountancy I for Cost Accountants, State Accounts and Finance, Diploma in Commerce, I.A.C., I.C.B. (SA), Banker's Diploma, etc. The same principle holds good for many other subjects and it is possible for a student to obtain more than one qualification simultaneously during his period of study. Full-time students, in particular, can utilize this advantage to the full, while such an arrangement can also be made for part-time students in consultation with heads of departments.

#### Exemptions

The attention of prospective students is drawn to the regulations of professional institutes, as well as those of the Department of National Education (for the National Diplomas), in connection with exemption from certain subjects or courses. In most cases application may be made for exemption in appropriate subjects in which candidates have previously been successful.

#### Subject successes

Subject successes are usually accumulated, with a few exceptions where a pass mark is required in all subjects at the same examination session. This means that a student can usually continue his course, even if he has not passed in all the subjects of the previous year, and that he receives credit for the subjects which he has passed. However, a candidate must have passed Mercantile Law I, for example, before writing the examination in Mercantile Law II.

## B. TRAINING AND OPPORTUNITIES FOR PUBLIC SERVANTS

General information: Completed application forms for entry to the Public Service may be posted to the Secretary, Public Service Commission, Private Bag X121, Pretoria, or handed in at any magistrate's office. Those who are interested can also make

personal inquiries or post applications to any of the seven regional offices of the Public Service Commission, of which a list appears on p.211.

On entering the Public Service, candidates are usually appointed to the rank of administrative assistant, after which they receive intensive in-service training in the fields mentioned below. Apart from practical training in the work, there is, for instance, an induction course for the new entrant, while a course in the fundamentals of supervision is conducted for more advanced officials. There are also other courses in specialized fields such as work study and basic computer principles for programmers. All these courses are offered free of charge during normal office hours.

Furthermore, National Diploma and Certificate courses in the fields which are discussed further on, are offered in collaboration with the colleges for advanced technical education and some technical colleges. Class fees are paid by the State. The examinations are conducted by the Department of National Education, which also issues the diplomas and certificates.

Candidates who are interested and who possess the necessary admission qualifications to equip themselves academically by means of study at a university, are also assisted financially (the Public Service Bursary Scheme) to obtain an appropriate degree.

Some of the fields in which candidates are trained and undergo in-service training, are the following:

## 1 ADMINISTRATION

### (i) General Administration

Requirements: Standard X Certificate with Afrikaans and English as subjects.

Training: In-service training as mentioned above and appropriate further training at a college for advanced technical education or technical college for the National Diploma in State Accounts and Finance (Inland Revenue or General), or the National Diploma (Public Administration).

Opportunities for advancement: The deserving person is, at an early stage, given a responsible position in which his personal aptitude can be fully realized and his potential utilized to the maximum. Promotion to the higher grades is not limited to one department and candidates can compete for senior positions in other Government departments. Salary scales providing for annual increments and accelerated promotion, as well as recognition of post-school qualifications, increase the possibility of attaining an extremely responsible position in the Public Service. The present avenue of promotion is: Senior Administrative Assistant, Administrative Officer, Administrative Control Officer, Under-Secretary, Deputy-Secretary, Secretary.

### (ii) Financial Administration

Requirements: Standard X Certificate with Afrikaans and English as subjects. Mathematics is not a requirement but an aptitude for figures is.

Training: In-service training as mentioned above and further training at a college for advanced technical education or technical college for the National Diploma (State Accounts and Finance).

Opportunities for advancement: As for General Administration. The present avenue of promotion is as follows: Assistant Accountant, Accountant, Senior Accountant, Assistant Chief Accountant, Chief Accountant.

### (iii) Personnel Administration

Requirements: Standard X Certificate with Afrikaans and English as subjects.

Training: In-service training as mentioned above and further training at a college for advanced technical education for the National Diploma (Public Administration).

Opportunities for advancement: As for General Administration. The opportunities for a capable personnel officer are virtually unlimited. Exceptional achievements and



improvement of qualifications are rewarded. He competes for promotion in all departments and can reach the highest posts in the Public Service by dint of efficient service.

(iv) Registration of Deeds

Personnel of the Deeds Offices of the Department of Justice can take the three-year course for the National Diploma in Registration of Deeds (Public Service) by means of correspondence. The course is offered departmentally and is free of charge. Full particulars on the course appear on p.85.

(v) Stores Administration

Requirements: Standard X Certificate with Afrikaans and English as subjects. Candidates should have an aptitude for figures.

Training: In-service training as mentioned above and further training for the National Diploma (Materials Management) at a college for advanced technical education.

Opportunities for advancement: There are stores branches in various departments, with the result that an officer's opportunities are not limited to a single department. As in the case of other sections, meritorious work is well rewarded.

2. LIBRARY ASSISTANT

Requirements: Standard X Certificate.

Training: Library assistants receive in-service training. Higher educational qualifications can also be obtained at a university, for example a B.A. degree in Library Science or a recognized Diploma in Librarianship.

Opportunities for advancement: On attainment of the necessary qualifications, the candidate can be appointed as a librarian. The salary scales with annual increments are attractive and provision is made for the recognition of further qualifications and the rewarding of outstanding work.

3. MAGISTRATE

Requirements: Standard X Certificate or Standard X Certificate (Matriculation Exemption).

Training: Candidates may be appointed in magistrates' offices directly after leaving school and their main task is general clerical work. Magistrates and public prosecutors (legal assistants) must, however, possess law qualifications. Special opportunities are offered to candidates to obtain these qualifications at universities and provision is made for the following:

- Persons with or without Matriculation Exemption may pass the Public Service Examination in Law and afterwards the Senior Public Service Examination in Law. (No requirement with regard to Latin.) The former is the minimum requirement for promotion to magistrate.
- Candidates who have Matriculation Exemption but who do not have Latin as a school subject, can obtain the B. Juris degree for civil servants or they may follow a special course in Latin at the university with a view to admission to other degree courses in Law.
- Candidates with Matriculation Exemption and who also have Latin as a school subject may enrol for any of the usual degree courses in Law.

Opportunities for advancement: New magisterial districts are continually being created and more and more magistrates' offices are being opened. Candidates are appointed as administrative assistants and on obtaining the Diploma for the Public Service Law Examination, the B. Juris degree or other legal qualifications, they are promoted to Legal Assistants. Capable persons can thereafter progress as follows: Assistant Magistrate, Magistrate, Senior Magistrate, Principal Magistrate and Chief Magistrate.

#### 4. MASTER OF THE SUPREME COURT

Requirements: Standard X Certificate. Candidates seeking promotion to higher ranks must at least have passed the Public Service Law Examination.

Training: A candidate is not directly appointed as Master of the Supreme Court. He starts his career as an administrative assistant and receives in-service training by means of courses in supervision and control of the administration of deceased and insolvent estates. These courses, which are of one to two months' duration, are from time to time offered free of charge by the training division of the Department of Justice in Pretoria.

Candidates are encouraged to study Law at a university in order to receive further appropriate training. Bursaries for full-time as well as part-time study are made available annually by the Public Service Commission. Further particulars in connection with Law studies for public servants can be obtained direct from the universities. The addresses of the universities appear on p.220.

Opportunities for advancement: Meritorious work and the attainment of higher qualifications are regularly rewarded and officials can advance to the following higher posts: Administrative Officer, Assistant Master of the Supreme Court, Master of the Supreme Court and Chief Master of the Supreme Court.

#### 5. AUDITOR

Requirements: Standard X Certificate with Afrikaans and English as subjects. Mathematics or Bookkeeping is not a requirement but arithmetical aptitude is.

Training: Assistant auditors receive in-service training and further training at a college for advanced technical education for the National Diploma State Accounts and Finance (General).

Opportunities for advancement: The continually expanding activities of the Public Service and the accompanying expenditure of Public funds ensure that there will be favourable opportunities for advancement for the capable auditor. Meritorious work and the attainment of higher qualifications do not go unrewarded. The line of promotion is at present as follows: Assistant Auditor, Auditor, Senior Auditor, Assistant Chief Auditor, Chief Auditor.

#### 6. PROGRAMMER

Requirements: A Standard X Certificate, preferably with Mathematics as a subject, plus a minimum of four years' actual and/or nominal experience in the Public Service. Candidates must also write a special aptitude test and appear before a selection committee.

Training: Candidates receive in-service training by taking the courses prescribed for this purpose. Those interested can take the course for the National Diploma (Electronic Data Processing and System Analysis) at a college for advanced technical education.

Opportunities for advancement: Programmers are not limited to the programming branch only, but with their valuable training and experience are in a position to compete for promotion in other branches and departments of the Public Service. They can advance to the rank of senior programmer without a vacancy having to exist in the higher rank. The present avenue of promotion is the following: Assistant Programmer, Programmer, Senior Programmer, Chief Programmer.

#### 7. COMPUTER OPERATOR

Requirements: A Standard X Certificate or equivalent, preferably with Mathematics and Accountancy as subjects. Candidates must sit for an aptitude test.

Training: Computer operators receive theoretical as well as practical in-service training. The courses are offered departmentally and frequently in collaboration with suppliers of computers.

Opportunities for advancement: Computer operators are employed by several departments while different types of computers are also being used. The competent person therefore should not experience problems in this career. The avenue of promotion at the moment is: Senior Computer Operator and then Chief Computer Operator.

#### 8. TYPIST

Requirements: The minimum requirement for appointment is a Standard VIII or equivalent certificate and a pass in Typewriting as a full subject for the Standard X or equivalent certificate. However, candidates with a Standard X Certificate receive preference and are offered a higher commencing salary.

Training: Newcomers are trained in the job situation by experienced senior typists and short courses are also offered during office hours.

Opportunities for advancement: In addition to promotion to the supervisory ranks in typing offices, typists may also be considered for posts as private secretaries to ministers or personal typists to heads of government departments. In these cases they act as personal typists and/or receptionists who annually accompany their superiors from Pretoria to Cape Town for the duration of the parliamentary session. Typists are considered for promotion to the post of senior typist after a few years' service. Additional qualifications in typing, snelskrif and shorthand, for example, can limit this period to a minimum. Senior typists can advance to the rank of Head Typist.

#### 9. WORK STUDY OFFICER

Requirements: Standard X Certificate, preferably with Mathematics as a subject. Only persons who are already employed by the Public Service are considered for appointment. Candidates must also pass an aptitude test.

Training: A work study training course is offered free of charge during office hours in Pretoria by the Public Service Commission. It is of approximately nine weeks' duration and its successful completion is a prerequisite. Those interested can take the course for the National Diploma (Organization and Method Study) at a college for advanced technical education.

Opportunities for advancement: Work study officers can compete for promotion in various divisions and departments of the Public Service. The present avenue of promotion is: Assistant Work Study Officer, Work Study Officer, Senior Work Study Officer and then Chief Work Study Officer.

#### C. NATIONAL DIPLOMA AND CERTIFICATE COURSES

Admission qualifications: Unless otherwise stated, candidates for all the courses must have a Standard X Certificate or an equivalent qualification.

Candidates who have not passed both official languages (Std X or equivalent) must pass such language(s) either at Diploma level or at Std X level before a certificate or diploma can be awarded. At least one of the official languages must be passed on the higher grade (A).

##### Provisional admission

Candidates who are at least 23 years of age but who do not have a Std X Certificate or an equivalent certificate, may be admitted to a course on condition that such candidates must obtain the Std X Certificate or an equivalent certificate before a diploma or certificate is awarded to them.

Candidates who have passed at least five subjects for the Std X Certificate or an equivalent certificate, but who have not satisfied the requirements for the award of such certificate, may be admitted provisionally, provided that the National Diploma or Certificate shall not be awarded to them unless they have satisfied the requirements for the award of a Std X Certificate or an equivalent certificate.

Candidates who lack one subject to qualify for an equivalent overseas certificate may likewise be admitted to a course provisionally, provided that the National Diploma or Certificate shall not be awarded to them unless they have satisfied the requirements for the award of a Std X Certificate.

In addition to the above, the Secretary for National Education may lay down further conditions for provisional admission to a course.

Duration of the courses: The National Diploma courses which are offered either full-time or in the form of part-time or sandwich courses, extend over three years.

Unless otherwise stated, the duration for the training of all certificate courses extends over one year (part-time).

Candidates who have obtained exemption from at least 4 subjects for the Diploma courses may complete the course in the minimum period of two years.

## 1. BUSINESS MANAGEMENT

### NATIONAL DIPLOMA (BUSINESS MANAGEMENT)

#### Subjects

##### First year

Financial Accounting I  
Industrial Accounting I  
Management Economics  
Economics I

##### Second year

Management Principles and Practice I  
Management Control I  
Production and Marketing  
Principles of Electronic Data Processing

##### Third year

Management Principles and Practice II (Major subject)  
Management Control II (Major subject)  
Industrial Legislation  
Statistical Methods

Additional subjects which may be taken in any year of study: Afrikaans A or B and/or English A or B.

Note: This Diploma is also accepted by the Association for Business Management for membership.

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: This is a purposeful course, which is particularly designed to prepare persons who are already in the practical situation more fully for a successful career at the managerial level. Apart from the main managerial fields such as general manager, branch manager and divisional manager, there are opportunities for specialization in commercial and industrial undertakings in fields such as those of personnel manager, sales manager, marketing manager, financial manager and so forth.

See also p.69.

## 2. COMMERCE

### NATIONAL DIPLOMA (COMMERCE)

Note: Twelve courses are required of which the official languages (one on the A level and the other on the A or B level) and two commercial subjects, to be taken on the third year level, are compulsory.

#### Optional subjects

Financial Accounting I, II and III  
Economics I, II and III  
Applied Business Economics I, II and III  
Mercantile Law I, II and III

Optional subjects (Continued)

Secretarial Practice I and II  
Typewriting I (35/40 w.p.m.)  
Typewriting II (45/50 w.p.m.)  
Typewriting III (55/60 w.p.m.)  
Snelskrif I (70/80 w.p.m.)  
Snelskrif II (100/120 w.p.m.)  
Snelskrif III (140 w.p.m.)  
Shorthand I (70/80 w.p.m.)  
Shorthand II (100/120 w.p.m.)  
Shorthand III (140 w.p.m.)

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: This diploma is of particular value to women who are interested in administrative work and/or desire to obtain an advanced and sought-after qualification in Snelskrif, Shorthand and Typing. The other subjects are equally useful and can even be required as a qualification for a particular post. The course may, however, also be successfully pursued by male students. All commercial undertakings, certain government departments, provincial administrations, the railways, municipalities, building societies, banks and so forth need the services of persons with this training.

3. COST ACCOUNTING

NATIONAL DIPLOMA (COST ACCOUNTING)

Subjects

First year

Financial Accounting I  
Industrial Accounting I  
Office Practice and Procedures  
Statistical Methods

Second year

Financial Accounting II  
Industrial Accounting II  
Management Economics  
Economics I

Third year

Financial Accounting III (Major subject)  
Industrial Accounting III (Major subject)  
Industrial Legislation  
Principles of E.D.P.

Additional subjects which may be taken in any year of study: Afrikaans A or B and/or English A or B.

Training centres

Colleges for Advanced Technical Education.

Vocational service: The function of the cost and management accountant of a large undertaking in a growing economy is of the greatest importance. The demand for qualified cost accountants also exceeds the supply. Advertisements for such posts, offering attractive salaries, appear regularly in the press. There are attractive posts in the accounts sections of, for example, government departments, the provincial administrations, the railways and the post office. Large commercial and industrial undertakings such as factories, insurance companies, construction companies, co-operatives, mines, Sasol, Iscor, building societies and so forth also employ cost accountants. There are adequate opportunities of advancing to the managerial level.

See also p.69.

4. DISTRIBUTIVE TRADE

NATIONAL CERTIFICATE (DISTRIBUTIVE TRADE PRACTICE),

NATIONAL CERTIFICATE (DISTRIBUTIVE TRADE SUPERVISION), and  
NATIONAL DIPLOMA (DISTRIBUTIVE TRADE ADMINISTRATION)

Nature and duration of the courses: The three courses are successive and each of them extends over one year.

First year: Part I

(i) NATIONAL CERTIFICATE (DISTRIBUTIVE TRADE PRACTICE)

Admission qualification: See p. 74.

Subjects

Afrikaans A or English A  
Distributive Trade Administration 1  
Financial Accounting 1  
Mercantile Law 1

Second year: Part II

(ii) NATIONAL CERTIFICATE (DISTRIBUTIVE TRADE SUPERVISION)

Admission qualification: Completion of Part I.

Subjects

Distributive Trade Administration 11  
Secretarial Practice 1  
Commercial Distribution 1  
Theory and Practice of Supervision

Third year: Part III

(iii) NATIONAL DIPLOMA (DISTRIBUTIVE TRADE ADMINISTRATION)

Admission qualification: Completion of Part II.

Subjects

Distributive Trade Administration 111 (Major subject)  
Commercial Distribution 11 (Major subject)  
Secretarial Practice 11  
Principles of Electronic Data Processing

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: The growth in large-scale retail trade organizations such as departmental stores, bazaars, chain stores, supermarkets and mail-order houses has caused an increasing demand for trained managers in the distributive trade. The three courses mentioned above provide for training in the theoretical aspects of distributive trade, which is then followed up by practical in-service training.

5. ELECTRONIC DATA PROCESSING AND SYSTEM ANALYSIS

NATIONAL DIPLOMA (ELECTRONIC DATA PROCESSING AND SYSTEM ANALYSIS)

Admission qualification: A Standard X or equivalent certificate with a pass in Mathematics.

Subjects

First year

Electronic Data Processing I  
Principles of E.D.P.  
Organization and Method Study I  
Financial Accounting I

Second year

Electronic Data Processing II  
Organization and Method Study II  
Management Principles and Practice I  
Statistical Methods

Third year

Electronic Data Processing III (Major subject)  
Organization and Method Study III (Major subject)

Third year (Continued)

Management Principles and Practice II OR  
Office Practice and Procedures OR  
Financial Accounting II  
Management Economics OR Mathematics T1

Additional subjects which may be taken in any year of study: Afrikaans A or B and/or English A or B.

Training centres

Colleges for Advanced Technical Education.

Vocational service: It is a comprehensive course and is designed to supply thorough preparation for a career in the world of computers. It also places candidates at the forefront of modern techniques in the business world. Business undertakings are also realising to an increasing extent that the services of the computer have today become virtually indispensable. Trained persons can advance rapidly in all organizations which use computers such as, for example, the firms which manufacture computers, banks, government departments, the CSIR, insurance companies, mining offices and many others.

See also p.69.

6. HOTEL MANAGEMENT

NATIONAL DIPLOMA (HOTEL MANAGEMENT)

Admission qualifications: In addition to the admission qualifications mentioned on p. 74, the following are also required by the Hotel Board: The maximum age at enrolment is 23 years (but preferably less); men must have completed their full-time military training; students must be unmarried and must remain unmarried for the duration of the course and applicants must appear before a selection committee.

Nature and duration of the course: This full-time course extends over three years. Students must obtain one year's practical experience in addition to attending classes for two years, before a diploma will be issued to them.

First year

Hotel Administration I  
Hotel Accounting I  
Hotel Catering I  
Hotel Management  
Afrikaans A or B OR  
English A or B  
Hotel Law I

Second year

Hotel Administration II  
Hotel Accounting II  
Hotel Catering II  
Hotel Law II  
French (Catering terminology)  
English A or B OR Afrikaans A or B  
(The language not taken in the first year)

At least one of the language courses must be taken on the higher grade (A). The second language may be examined either externally or internally.

Bursaries: The Hotel Board offers a considerable number of bursaries to male students to cover, inter alia, hostel accommodation and uniforms. Annually a few of the best students can also earn bursaries to undergo their final practical training abroad.

Training centre

Applications for admission to the course should be directed to The Director, Hotel Board, P.O. Box 244, Pretoria 0001, and the training takes place at the Witwatersrand College for Advanced Technical Education.

7. HOTEL AND INDUSTRIAL CATERING

NATIONAL CERTIFICATE (HOTEL AND INDUSTRIAL CATERING)

Nature and duration of the course: The course is offered on a full-time basis over two years.

### First year

Commercial Cookery I  
Catering Hygiene and Nutrition  
Catering: Theory  
Afrikaans A OR English A

### Second year

Commercial Cookery II  
Food Costing and Menu Planning  
Kitchen Planning and Administration  
English A or B OR Afrikaans A or B  
(Not the language taken in the first year)

At least one of the language courses must be taken on the higher grade (A).

Bursaries: A limited number of bursaries similar to those for the National Diploma (Hotel Management) are available from the Hotel Board.

### Training centre

Witwatersrand College for Advanced Technical Education.

## 8. HOTEL RECEPTION

### NATIONAL CERTIFICATE (HOTEL RECEPTION)

Nature and duration of the course: The course extends over one year and is offered on a full-time basis. (Part-time candidates will obviously take longer to complete the course.)

Afrikaans A or English A  
Typewriting I (35/40 w.p.m.)  
Elementary Hotel Administration  
Hotel Reception

### Internal examinations

Speech and Department  
A modern foreign language (spoken language)  
B language (written and oral)

Note: Both official languages must be taken in the course, at least one on the higher grade (A).

### Training centres

Colleges for Advanced Technical Education.

Vocational service: It is possible for persons who are interested in the hotel industry to prepare themselves for such a career by means of in-service training. Some hotels and hotel groups regularly accept a limited number of pupils for training. However, it would appear that there is a marked tendency on the part of hotels to employ trained personnel rather than to organize the training themselves.

Those interested are consequently advised first to pursue one of the aforementioned courses in preparation for a hotel career. The three courses also offer an ideal opportunity to persons who have already had practical experience to supplement it by means of specialized and formal education and training.

The hotel and catering trade is destined to develop into an important labour sector as the hotel industry improves and better transport facilities attract more and more tourists to South Africa. There are also a large number of functions in the trade which all require the services of well-trained personnel. The opportunities for a permanent career as manager of a hotel, a motel or a hotel group are virtually unlimited. The same is true of a caterer in the employment of an undertaking or with an undertaking of his own. It is generally known, for example, that a head chef may earn even more than the manager of a hotel. There are also excellent prospects for persons, usually women, who are interested in hotel reception, are fully bilingual and can also speak one or more foreign language(s).

As a result of the system of grading of hotels, the expansion of tourism and the rapid development of the hotel trade, there is a great demand for trained managerial and supervisory personnel.

## 9. INDUSTRIAL ADMINISTRATION

### NATIONAL DIPLOMA IN INDUSTRIAL ADMINISTRATION

Admission qualification: The minimum qualification is a pass in the following subjects at the Standard X level:



English

Afrikaans

Mathematics or Physical Science or Applied Mechanics or Chemistry or Physics or Economics.

The National Diploma in Industrial Administration will be awarded to a candidate who has satisfied the examination requirements and can produce evidence that - he has been employed for a period of at least two years prior to the completion of the course in a work study, production planning or similar office,

OR

he has attained a National Technical Diploma (formerly known as the National Engineering Diploma) or a National Diploma in advanced technical training.

Nature and duration of the course: The course is offered on a full-time, sandwich, part-time or correspondence basis. The full-time course extends over one year and the part-time course over two years.

Subjects

Part A

Production Planning and Control T1  
Work Study T1  
Human Factor in Management T  
Costing and Estimating T  
Languages T

Part B

Production Planning and Control T2  
Work Study T2  
Applied Statistics T  
Industrial Legislation T

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Vocational service: There is a continual increase in the demand for trained production and factory managers in South Africa. In order to satisfy this need and to combat the shortage of production officials in general, this course was established after consultation with, inter alia, various professional institutes, government departments and large organizations in commerce and industry. Candidates receive valuable training in the latest production methods and the procedure which must be followed for the promotion of productivity. For the person who is interested in his work and who desires to attain maximum productivity, this diploma is definitely a key to senior positions which offer interesting work and for which the remuneration is above average.

10. JOURNALISM

NATIONAL DIPLOMA (JOURNALISM)

Subjects

Part I (First year)

Practice of Journalism I  
Press Law  
English A or Afrikaans A for Journalists  
Theory of Politics for Journalists  
Typing for Journalists (Key-board course) (Internal examination)  
English B (Oral), or Afrikaans B (Oral) for Journalists (Internal examination)

Part II (Second year)

- (a) Practice of Journalism II  
English A or B OR Afrikaans A or B for Journalists (not the language taken in the first year of the course)
- (b) Two of -  
Court Reporting  
Economics and Finance for Journalists  
Sport and Recreation for Journalists  
Political Journalism  
Feature and Review Writing

Shorthand I  
Snelskrif I

Part III (Third year)

Practice of Journalism III  
Three subjects selected from

- (i) those listed under (b) of Part II and
- (ii) Shorthand II and/or Snelskrif II if students have passed in Shorthand I and Snelskrif I under Part II (Second year)

Training centres

Colleges for Advanced Technical Education.

Vocational service: In the rapidly changing world of to-day people have a growing need for reliable information on what is happening around them, and ever higher standards are required of those who convey the information, with the emphasis on what is conveyed and how it is conveyed. Journalism comprises the art of writing articles or gathering news and other information, processing it and presenting it to the public in acceptable form. Thus it is essential for the journalist to be properly trained. Even though a matriculant may be taken into service as an apprentice journalist by an organization to undergo in-service training, the theoretical background provided by a course such as this one is essential.

Journalism is not limited to daily papers or magazines. There are also the radio and television, which embrace many fields and offer many opportunities.

11. MATERIALS ADMINISTRATION AND MANAGEMENT

NATIONAL CERTIFICATE (MATERIALS ADMINISTRATION) and  
NATIONAL DIPLOMA (MATERIALS MANAGEMENT)

Admission qualifications: The admission qualification set out on p. 74 also applies to the Certificate course. The completed courses for the Certificate (Parts I and II) serve as admission to the Diploma course.

Nature and duration of the courses: The course for the Certificate extends over two years and the Diploma can be obtained after one additional year of study.

(i) NATIONAL CERTIFICATE (MATERIALS ADMINISTRATION)

Part I (First year)

Materials Handling I OR  
Purchasing Administration I  
Applied Business Economics I  
Stocks and Stores Control I  
Work Study I (for students taking  
Materials Handling I) OR  
Financial Accounting I (for students  
taking Purchasing Administration I)

Part II (Second year)

Materials Handling II OR  
Purchasing Administration II  
Stocks and Stores Control II  
Applied Business Economics II  
Industrial Legislation (for students  
taking Materials Handling II) OR  
Mercantile Law I (for students  
taking Purchasing Administration II)

(ii) NATIONAL DIPLOMA (MATERIALS MANAGEMENT)

Part III (Third year)

Materials Handling III OR Purchasing  
Administration III  
  
Applied Business Economics III  
Principles of Electronic Data Processing  
Associated Techniques I

Training centres

Colleges for Advanced Technical Education.

Vocational service: Apart from trading stock all organizations to some extent have materials and equipment over which proper control must be exercised by qualified persons.

In the Public Service materials management mainly involves the buying and control of and responsibility for materials and equipment. The task of the materials manager is a highly responsible one, since the value of materials may run into millions

of rand. There are materials divisions in various departments, so that officials do not depend for promotion on one department only.

See also p. 72.

12. ORGANIZATION AND METHOD STUDY

NATIONAL DIPLOMA (ORGANIZATION AND METHOD STUDY)

Subjects

First year

Organization and Method Study I  
Financial Accounting I  
Statistical Methods  
Management Principles and Practice I

Second year

Organization and Method Study II  
Work Study I  
Industrial Accounting I  
Principles of E.D.P.

Third year

Organization and Method Study III (Major subject)  
Work Study II (Major subject)  
Systems Analysis and Design  
The Human Factor in Management

Additional subjects which may be taken in any year of study: Afrikaans A or B and/or English A or B.

Note: This Diploma is also accepted by The S.A. Institute of Organization and Methods for membership.

Training centres

Colleges for Advanced Technical Education.

Vocational service: The rapid growth and development of the various sectors of the South African economy, the present economic climate and the necessity to ensure that labour is utilized as productively as possible, have caused a great demand for properly trained organization and method study officers. All large organizations such as the Public Service, provincial administrations, the railways, large municipalities and business undertakings, employ O. and M. officers. There are opportunities for promotion, but the able person with vision and insight can himself contribute greatly towards accelerating promotion by virtue of his position and job circumstances, even, as often happens, to top management posts.

See also p. 74.

13. PHOTOGRAPHY

NATIONAL CERTIFICATE IN PHOTOGRAPHY and

NATIONAL DIPLOMA IN PHOTOGRAPHY

Nature and duration of the courses: The National Diploma in Photography extends over three years of full-time study. Students currently employed in professional photographic practice may attend classes on a part-time basis and also complete the diploma course in three years.

A National Certificate in Photography will be awarded to students who pass the first-year subjects of the diploma course. Part-time students who are not employed in professional photographic practice must attend classes over a period of two years before they may enter for the National Certificate in Photography examinations. Students who wish to continue with the diploma course after having passed the certificate course must either attend classes for a further two years on a full-time basis or obtain employment in the photographic field, in which case the course can also be completed on a two-year part-time basis.

First year (Certificate Course)

Photographic Theory I  
Practical Photography I  
Photographic Physics and Chemistry I  
Darkroom Practice I

Second year

Photographic Theory II  
Practical Photography II  
Visual Communication I  
Photographic Physics and Chemistry II  
Darkroom Practice II

### Third year

Photographic Theory III  
Practical Photography III  
Visual Communication II  
Photographic Business Management  
Darkroom Practice III  
Photography - Specialized subject

### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Vocational service: Holiday-makers, tourists and many other persons are seen everywhere carrying expensive photographic equipment and one gets the impression that the world is full of photographers. In actual fact, these persons are usually amateurs who take snapshots and are mainly interested in coloured snaps and colour slides.

True photography involves much more. It requires, among other things, training, skill and enthusiasm to such an extent that the equipment which is used merely becomes the necessary tool in the hands of an expert and an artist. The successful and true photographer is, in fact, a technician as well as an artist. Apart from the handling of apparatus, which must be second nature to him, he must also have an eye for what will make a good photograph and the more delicate sense of composition and balance; he should actually be able to paint with the aid of light.

The courses, and particularly the diploma course, are comprehensive and offer the essential theoretical background together with adequate opportunities for gaining practical experience. As more experience is gained in the practical situation, a person should have no difficulty in making a success of a career in photography.

Of the fields which can usually be pursued, there are, for example, the press photographer in the employment of newspaper and periodical concerns, the industrial photographer in the employ of commerce and industry, the camera-man in the service of a film company, the photographer employed by a Government department or the studio photographer with his own undertaking.

## 14. PRINTING MANAGEMENT

NATIONAL DIPLOMA ( PRINTING MANAGEMENT )

Admission qualifications: One of the following: National Printer's Diploma, National Printer's Certificate (Part III), National Technical Certificate (Part III), Standard X Certificate or any equivalent qualification.

Nature and duration of the course: The course extends over three years and is offered on a part-time basis.

### First year

Printing Processes I  
Financial Accounting I  
Management Principles  
and Practice I  
Industrial Legislation

### Second year

Printing Processes II  
Cost Accounting for Printers  
Estimating for Printers  
Economics I

### Third year

Printing Processes III  
Human Factor in Management  
Work Study I  
Law for Printers

Note: This Diploma is also accepted by The S.A. Institute of Printing for membership.

### Training centres

Colleges for Advanced Technical Education.

Vocational service: The printing and newspaper industry plays an important part in modern communication. It offers attractive and challenging managerial positions. The course is intended to equip the prospective manager with sufficient knowledge which can only be to his advantage during his career in the Industry. The S.A. Institute of Printing confers professional status on those who have completed the course.

The National Industrial Council of the Printing and Newspaper Industry and the Educational Fund of the Employer's Organisations in the Industry provide a number of bursaries to cover the fees for the course.

## 15. PROPERTY VALUATION

NATIONAL DIPLOMA (PROPERTY VALUATION)

### Subjects

#### First year

General Building Practice  
Financial Accounting I  
Mercantile Law I  
Economics I

#### Second year

Valuations I  
Local Government Administration  
Economics II  
Afrikaans A or B OR English A or B

#### Third year

Valuations II (Major subject)  
Advanced Valuations Techniques  
English A or B OR Afrikaans A or B (The language not taken during the second year of the course)  
Practical Valuations (Major subject)

At least one of the language courses must be taken on the higher grade (A).

Note: This Diploma is also accepted by The S.A. Institute of Valuers for membership.

### Training centres

Colleges for Advanced Technical Education.

Vocational service: The personal attributes which one should possess in order to become a competent valuer do not differ from those which are needed for other professions: moral integrity, common sense, accuracy, clear thinking, patience accompanied by steadfastness, a pleasant personality and so forth. Honesty is of the greatest importance since many people, organizations and undertakings rely on the integrity and impartiality of the valuer.

The valuation of fixed property is specialized work which may also involve activities of a divergent nature. Valuers may work for estate companies or they may be appointed as valuers by the State, the provincial councils and local authorities. They may also accept positions in commercial and financial undertakings or be appointed as valuers for the purpose of administering the Estates Act. They may also be nominated as members of valuation, arbitration and expropriation courts, etc. Their expert evidence is of great value in court cases. There are still many vacancies at the top for able persons. The qualified valuer with the necessary experience receives extremely adequate remuneration, according to the type of work he does. However, the ability to give the correct advice to persons and undertakings, to value property impartially and expertly and to know that he is a highly respected member of the community brings the type of reward which cannot be measured in terms of money.

## 16. PUBLIC ADMINISTRATION

NATIONAL DIPLOMA (PUBLIC ADMINISTRATION)

Subjects

First year

Public Administration I  
Economics I  
Afrikaans A or B  
English A or B

Second year

Public Administration II  
Economics II  
Industrial Psychology I  
Law I

NB: At least one of the language courses must be taken on the higher grade (A).

Third year

Public Administration III (Major subject)  
Economics III (Major subject)  
Industrial Psychology II  
Law II

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: The course offers candidates who have been appointed to the general administration division of a Government department the opportunity of further equipping themselves for their careers.

See also p. 71.

17. REGISTRATION OF DEEDS

NATIONAL DIPLOMA IN REGISTRATION OF DEEDS (PUBLIC SERVICE)

Admission qualification: Staff members of the Deeds Offices in the Department of Justice who have a minimum qualification of Standard X with Afrikaans and English as compulsory subjects are eligible for admission to the course.

Nature and duration of the course: The various deeds offices are found in Pretoria, Cape Town, Pietermaritzburg, Kimberley, King William's Town, Vryburg, Windhoek and Bloemfontein.

The diploma course is a three-year course offered solely by means of written lectures, but one of the deeds offices arranges an intensive course of lectures lasting two weeks at the end of each year of training just before candidates write their examinations. The whole course is offered free of charge.

First year

Roman Dutch Law I  
Mercantile Law I  
Deeds Registry Practice and Procedure I

Second year

Roman Dutch Law II  
Mercantile Law II  
Deeds Registry Practice and Procedure II  
Special Statutes I

Third year

Roman Dutch Law III  
Interpretation of Statutes  
Deeds Registry Practice and Procedure III  
Special Statutes II

Vocational service: This course is intended for personnel in the deeds offices of the Department of Justice. See also p. 72.

18. SAFETY MANAGEMENT

NATIONAL DIPLOMA IN SAFETY MANAGEMENT

Subjects

First year

Legislation I  
Industrial Accident Prevention I  
Statistical Methods

Second year

Legislation II  
Industrial Accident Prevention II  
Management Principles and Practice I

First year (continued)

Mines and Works Act OR  
Management Control I OR  
Human Factor in Management

Second year (continued)

Factory, Machinery and Building Work  
Act OR Management Control I OR  
Human Factor in Management

Third year

Legislation III (Major subject)  
Industrial Accident Prevention III (Major subject)  
Office Practice and Procedures  
Work Study I

Additional subjects which may be taken in any year of study: English A or B and/  
or Afrikaans A or B.

Note: At least one of the subjects Mines and Works Act and Factory, Machinery and  
Building Work Act is compulsory.

This Diploma is also recognised by The National Occupational Safety Association as  
a professional qualification in Safety Management.

Training centres

Colleges for Advanced Technical Education.

Vocational service: More and more industrialists are today accepting the fact that  
a safety officer has not only become indispensable but also that he should be  
thoroughly trained for the efficient execution of his duties. This attitude is  
clearly apparent from the increasing number of advertisements for qualified safety  
officers.

The course is intended to offer purposeful training to industrial safety officers.  
Apart from the subjects which are concentrated on safety aspects, the training in  
sections such as management, office practice and administration equips the can-  
didate to pull his weight as a member of the managerial team.

The Godfrey Terry Memorial Bursary Fund makes provision for financial assistance to  
needy students of all races who wish to enrol for this Diploma Course. Applications  
should be directed to the Trustees at the address P.O. Box 26434, Arcadia 0007.

19. SECRETARIAL COURSES

(i) NATIONAL SECRETARIAL CERTIFICATE

Nature and duration of the course: The course extends over one year and is offered  
on a full-time basis. (Part-time candidates will obviously take longer to complete  
the course.)

1. Afrikaans A or English A
2. Typewriting I (35/40 w.p.m.)
3. Secretarial Practice I
4. and 5. - Two of:
  - (i) Shorthand or Snelskrif I (80 w.p.m.)
  - (ii) Snelskrif or Shorthand I (70 w.p.m.)  
(Not the subject taken under (i))
  - (iii) Financial Accounting I
  - (iv) Mechanised Calculations
  - (v) Afrikaans A or B OR English A or B  
(Not the subject taken under 1)
  - (vi) Legal Practice

Internal examinations

- (i) Speech and Deportment
- (ii) Elementary Practical Bookkeeping (only for students who have not studied  
Accounting at school)
- (iii) B Language (written and oral) (if not already taken for external examination  
purposes)

Note: Both official languages must be taken in the course, at least one on the  
higher grade. The second language can be examined either externally or internally.

### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Technical Institutes  
Some Correspondence Colleges.

Vocational service: See p. 88.

### (ii) NATIONAL HIGHER SECRETARIAL CERTIFICATE (PRIVATE SECRETARY)

Admission qualifications: A candidate must have a Standard X or equivalent certificate with commercial subjects.

Nature and duration of the course: The course extends over one year and is offered on a full-time basis.

1. Afrikaans A or English A
2. Typewriting II (45/50 w.p.m.)
3. Secretarial Practice I
4. Shorthand or Snelskrif II (120 w.p.m.)
5. ONE of:
  - (i) Snelskrif or Shorthand II (100 w.p.m.) (the subject not taken under 4)
  - (ii) Financial Accounting I
  - (iii) Mechanised Calculations
  - (iv) Afrikaans A or B OR English A or B (the subject not taken under 1)
  - (v) Legal Practice

### Internal examinations

- (i) Speech and Deportment
- (ii) Elementary Practical Bookkeeping (only for students who have not studied Accounting at school)
- (iii) B language (written and oral) (if not already taken under 5 (iv))

Note: Both official languages must be taken in the course, of which at least one must be on the higher grade. The second language can be examined either externally or internally.

### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Technical Institutes  
Some Correspondence Colleges.

Vocational service: See p.88.

### (iii) NATIONAL ADVANCED SECRETARIAL CERTIFICATE (PRIVATE SECRETARY)

Admission qualifications: A candidate must have either the National Secretarial Certificate or the National Higher Secretarial Certificate (Private Secretary).

Nature and duration of the course: The course extends over one year and is offered on a part-time basis.

1. Afrikaans A or B OR English A or B
2. Typewriting III (55/60 w.p.m.)
3. Secretarial Practice II
4. Shorthand or Snelskrif III (140 w.p.m.)
5. ONE of:
  - (i) Snelskrif or Shorthand II (120 w.p.m.) (the subject not taken under 4)
  - (ii) Financial Accounting I (if not already taken)
  - (iii) Financial Accounting II
  - (iv) Economics I
  - (v) Mercantile Law I
  - (vi) Legal Practice

Note: Students who have already passed both official languages on the diploma level (at least one on the higher grade) are exempted from the subjects in 1 above.



### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Technical Institutes  
Some Correspondence Colleges.

Vocational service: The occupation of a private secretary imposes high demands and involves divergent duties which are mainly dependent on her place of employment. She forms a most important link between the public and the undertaking. Such a person should therefore be able to act with great responsibility, since she must often make decisions herself. Her duties are also often of a confidential nature and she must thus be trustworthy and absolutely loyal to her employer.

The private secretary or receptionist should consequently have a good training and background for her work. These three courses are intended for the training of young ladies of the proper calibre for the more elegant positions of private secretaries to managers and senior business managers in commerce and industry, as well as to highly placed professional officers and public servants. The first two courses were specially designed to serve as admission to the course for the National Advanced Secretarial Certificate. Students with this certificate are equipped for more responsible work, with the result that they can advance more rapidly to senior posts.

An able typist is a pillar of strength in any office and her training is consequently equally important. Depending on the nature and size of the undertaking, her work can vary from routine work to a combination thereof with other clerical tasks such as those of filing, bookkeeping, switchboard work and even duties as receptionist or private secretary. These courses should therefore also constitute the desired training for the typist, since she can also advance to a position as private secretary on the strength of her experience, ability and personality.

There are many positions in private undertakings and government departments in which typists, shorthand typists, private secretaries and receptionists play a key rôle. Positions may be obtained without any difficulty by means of personal contact or by replying to the many advertisements which appear in newspapers.

### (iv) NATIONAL SECRETARIAL CERTIFICATE (CONSULTING ROOM PRACTICE)

Nature and duration of the course: The course extends over one year and is offered on a full-time basis. (Part-time candidates will obviously take longer to complete the course.)

Afrikaans A or English A  
Typewriting I (35/40 w.p.m.)  
Secretarial Practice I  
Elementary Medical Knowledge and Ethics  
Practical Psychology and Principles of Social Work

### Internal examinations

Speech and Deportment  
Consulting Room Practice and Practical Bookkeeping (Practical Bookkeeping only for students who did not take Accounting at school)  
B language (written and oral)

Note: Both official languages must be taken in the course.

### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Technical Institutes.

Vocational service: The course adequately equips the receptionist to carry out routine and special tasks with self-confidence. Apart from a position as receptionist in the consulting rooms of a medical practitioner or dentist, the candidate may also be employed in an appropriate post in, for example, a hospital, a clinic, a welfare organization, the Department of Health, a medical aid scheme or with manufacturers and distributors of medical remedies and pharmaceutical products. As a

result of the provision which is made in her training, she can occupy a position as an ordinary private secretary or receptionist with equal success.

(v) NATIONAL SECRETARIAL CERTIFICATE (HOME MAKING)

Nature and duration of the course: The course extends over one year and is offered on a full-time basis. (Part-time candidates will obviously take longer to complete the course.)

Afrikaans A or English A  
Typewriting I (35/40 w.p.m.)  
Secretarial Practice I  
Cookery and Nutrition  
Needlework and Dressmaking

Internal examinations

Speech and Deportment  
Elementary Practical Bookkeeping (Only for students who have not studied Accounting at school.)  
B language (written and oral)

Note: Both official languages must be taken in the course.

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: Professional knowledge of home economics and a secretarial background form an ideal combination for persons (mostly women) who are interested in undertakings which specialize in the design, manufacture or selling of clothes (mainly women's wear). In such undertakings posts may be obtained in the course of time as, for example, sales managers, travelling representatives, advertising managers, private secretaries or other senior personnel.

20. SHIPPING AND FORWARDING ADMINISTRATION

NATIONAL DIPLOMA (SHIPPING AND FORWARDING ADMINISTRATION)

Subjects

Part I (First year)

Clearing and Forwarding Administration I  
Applied Business Economics I  
Stocks and Stores Control I  
Financial Accounting I

Part II (Second year)

Clearing and Forwarding Administration II  
Marine Transport I  
Applied Business Economics II  
Mercantile Law I

Part III (Third year)

Clearing and Forwarding Administration III  
Marine Transport II  
Export Promotion  
Principles of Electronic Data Processing

Training centres

Colleges for Advanced Technical Education.

Vocational service: Sea transport is one of the cheapest forms of transport and still plays an indispensable role in international trade. Modern passenger, mail, cargo and other service ships are effectively equipped with a view to the rapid and safe handling of cargoes. South Africa also possesses an ever growing commercial fleet in which Safmarine plays the biggest part. The harbours are controlled by the S.A. Railways and are extremely active. Modern tugs, dredgers, cranes, warehouses, etc. assist in expediting the movement of ships and cargo.

However, the degree of efficiency with which sea transport and consequently also the country's harbour facilities are handled, depends largely on the competence of the personnel. Training in certain facets of sea transport, particularly of those responsible for administrative duties, has definitely become desirable. Their prospects are enhanced by the extension of existing harbours and the development of new ones.

21. STATE ACCOUNTS AND FINANCE

NATIONAL DIPLOMA (STATE ACCOUNTS AND FINANCE)

(i) General

Subjects

First year

Financial Accounting I  
Economics I  
Public Administration I  
Afrikaans A or B OR English A or B

Second year

Financial Accounting II  
State Finance I  
Management Economics  
English A or B OR Afrikaans A or B  
(not the subject taken in the first  
year of the course)

Third year

Advanced and Machine Accounting (Major subject)  
State Finance II (Major subject)  
Auditing  
Mercantile Law I

(ii) Inland Revenue

Subjects

First year

Financial Accounting I  
Taxation I  
Economics I  
Afrikaans A or B OR English A or B

Second year

Financial Accounting II  
Taxation II  
Public Administration I  
English A or B OR Afrikaans A or B  
(not the language taken in the first  
year of the course)

Third year

Advanced and Machine Accounting (Major Subject)  
Taxation III (Major subject)  
State Finance I  
Mercantile Law I

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: These two courses, which are very closely related, offer candidates who have assumed service in the general administration or financial administration divisions of a government department, the opportunity of qualifying themselves further in financial matters.

See also pp. 71 and 73.

22. SUPERVISORY MANAGEMENT

NATIONAL CERTIFICATE IN SUPERVISORY MANAGEMENT

Admission qualifications: A Standard X Certificate, an NTC III (N3) or an equivalent certificate. In the case of a person with lesser qualifications, the minimum age for acceptance to the course will be 25 years and five years of suitable supervisory experience will then also be required.

Nature and duration of the course: The course is a sandwich or block release course entailing attendance of classes for two periods of ten weeks each. The course may also be offered on a part-time basis.

Course I

English A or Afrikaans A  
The Theory and Practice of Super-  
vision T  
Personnel Management T

Course II

Production Planning and Control  
Costing, Estimating and Cost Control T1  
Seminar in Supervision T (Examination  
subject)

Note: This Certificate is also accepted by the SA Institute of Supervisory Manage-  
ment for membership.

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

Vocational service: The opportunity of advancing from an ordinary post to posts at managerial level is created by the many posts of a supervisory nature. However, supervisors must, in addition to experience, have an appropriate theoretical know-  
ledge of aspects such as those which are essential for the determination of profit margins. The aim of this course is to improve the standard of supervisory manage-  
ment as a means to promote the productive efficiency of foremen, supervisors and others. A post as supervisor, foreman, chief clerk, divisional manager etc., is the first step in the direction of the managerial level and such posts exist in virtually all divisions of the Public Service and all sectors of commerce and in-  
dustry.

23. TOUR GUIDING

NATIONAL CERTIFICATE (TOUR GUIDING)

Admission qualifications: A Standard X Certificate or equivalent. Candidates who are 23 years or older are, however, exempted from this requirement.

Nature and duration of the course: The course extends over one year and is offered on a part-time basis.

Tourism I  
Tourism II  
Tour Organization

Optional (internal)

A modern foreign language (spoken language)  
Practical training

Training centres

Colleges for Advanced Technical Education.

Vocational service: See p. 92.

24. TOURISM

NATIONAL DIPLOMA (TOURISM)

Subjects

First year

Tourism I  
Tourism Techniques I  
Afrikaans A or B OR English A or B  
German I OR French I

Second year

Tourism II  
Tourism Techniques II  
German I OR French I (the language which  
was not taken in the first year)  
German II OR French II (the language which  
was taken in the first year)

Third year

Tourism III (Major subject)  
Tourism Techniques III (Major subject)  
German II OR French II (the language which was not  
taken in the second year)

### Third year (Continued)

Afrikaans A or B OR English A or B (the official language which was not taken in the first year).  
At least one of the official language courses must be taken on the higher grade (A).

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: Today tourism is one of the largest industries in the world. This is also the case in South Africa, which can rightly be termed a tourist paradise in which tourism is a flourishing branch of the country's economic activities. Attractive administrative and clerical posts are offered to matriculants by the Department of Tourism, which is responsible for the promotion and co-ordination of the industry. The acquirement of the National Diploma (Tourism) will not only result in an improvement in salary but will also create the opportunity for promotion to an interesting post such as that of liaison officer attached to one of the regional offices of the Department. Various other senior posts are available in the Department or, for example, in the service of the SA Tourist Corporation, the Publicity and Travel Department of the Railways, private tour organizations and travel agencies.

The aim of the two certificate courses, which are offered on a part-time basis, is to further the training of candidates and, in so doing, to bring tour guidance and administration in South Africa closer to the standards which are maintained in most other countries in this regard.

#### 25. TOURISM - CLERICAL

NATIONAL CERTIFICATE (TOURISM - CLERICAL)

Nature and duration of the course: The course extends over one year and is offered on a part-time basis.

Tourism Techniques I  
Tourism Techniques II  
Basic World Tourism

#### Optional (internal)

A modern foreign language (spoken language)  
Practical training

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: See above.

### D. COURSES AND EXAMINATIONS OF THE PROFESSIONAL BODIES

#### GENERAL INFORMATION

The colleges for advanced technical education, some technical colleges and a number of correspondence colleges offer instruction in the subjects which are prescribed for the examinations of the professional institutes. Some colleges offer the courses on a full-time, and others on a part-time basis, with day or evening classes.

Functions of professional bodies: Professional institutes and associations mainly fulfil two functions. In the first place, there is the training (not in-service training), examining and certification of student members. In the second place, these bodies create a "home" for their members who are attached to particular professions. The latter function, for example, include one or more of the following:

- Seminars, lectures and discussions on matters of general interest to the profession
- the establishment of a library and the circulation of printed matter among members
- information to members on new developments in the profession
- the application of an ethical code
- the privilege of recognition by employers and the general public
- the improvement of members' conditions of service.

Some of the professional bodies fulfil both the above-mentioned functions, while a large number fulfil only the second. In other cases, either the training or the training as well as the examining is administered by other authorities such as, for example, the various colleges under the control of the Department of National Education. In the latter case, the National Diplomas are acknowledged by the professional bodies for the purpose of membership.

Examinations: Examinations are usually conducted by the institute concerned or the Department of National Education during May and/or November of each year. However, these times may differ from one institute to another.

Regulations: Each institute has its own rules and regulations which must be complied with by students, for example as regards admission to the types of membership - Associate Members and Fellow Members - of the institute. Furthermore, there are rules in connection with compulsory practical experience, exemption from subjects and so forth, which are prescribed. Candidates are advised to become acquainted with all the regulations of the institute concerned as soon as possible.

Registration with the institute: In addition to enrolling for lectures at a college, students must also register as such with the institute concerned before certain fixed dates for the examinations in May and /or November. These dates differ from institute to institute.

Sufficient enrolments: Colleges for advanced technical education, as well as technical colleges, offer instruction in the subjects for the examinations conducted by the professional institutes but the presentation of a course is subject to sufficient enrolments in a particular field. More particulars should be obtained well beforehand from the colleges concerned.

Note: The particulars given in this book concerning the professional institutes merely serve as general information. Fuller details, for example about the value that membership of an institute may have for the interested student when he applies for a job, must be obtained from the institute concerned. The addresses of institutes appear on p. 217.

## 1. THE ACTUARIAL SOCIETY OF SOUTH AFRICA

### ACTUARY

An actuary is admitted as a Fellow of either the Institute of Actuaries (FIA), London or the Faculty of Actuaries (FFA), Edinburgh. (The decision as to which body is chosen must be made by the applicant himself.)

### Admission qualifications

#### Graduates

Candidates are normally accepted if they have majored in Mathematics at at least a second class level over three years. A candidate who has not majored in Mathematics is expected to show at least second class pass levels in the Mathematical subjects in which he has been successful as well as a first or second class pass overall. In addition to demonstrating mathematical ability, candidates must show that they have had a good general education and their school-leaving examination results will

be taken into account along with their university successes.

The above requirements apply provided the candidate makes application within four years of obtaining his degree.

#### Other candidates

Candidates must normally have secured a first class pass in the school-leaving examination with:

- (i) at least 80% in ordinary Mathematics and
- (ii) at least 70% in two other school subjects, together with evidence that they can express themselves clearly in speaking and writing. A good knowledge of English is essential in order that the candidate may understand the requisite courses he will study and to enable him to write the examinations. In addition the candidate must demonstrate his mathematical aptitude by having secured within the past four years a diploma in first year Pure Mathematics at the University of South Africa with not less than a good second class pass. An equivalent pass from any other South African university will be considered.

Nature and duration of the course: Studying is done by means of correspondence courses. There is no specified period for completion of the examinations. The minimum period is four years, but this is exceptional and a period of six to eight years is not uncommon. University graduates may, however, obtain exemptions from some of the subjects, thereby shortening the period.

#### Subjects

Mathematics

Probability and Elementary Statistics

Compound Interest

Life and Other Contingencies

Statistics

The Analysis of Mortality and Other Actuarial and Demographic Statistics

Economic Background to Finance and Investment

Finance and Investment

Life Office Practice

Pension Funds and Friendly Societies

Institutions which offer the course: There are two professional bodies conducting actuarial examinations. One is the Institute of Actuaries, with its headquarters in London, and the other is the Faculty of Actuaries, with its headquarters in Edinburgh. These two bodies jointly operate the Actuarial Tuition Service, with its headquarters in London, and handle all tuition matters. There is a local centre of the tuition service in Johannesburg and another in Cape Town.

A further course open to South African students, in addition to the examinations of the Institute and Faculty of Actuaries, is provided by the University of Cape Town. This is a full-time course within the Bachelor of Business Science degree. The student would study a rather wider field than pure actuarial science. Attainment of a good honours grading would normally ensure the graduate of this course substantial exemptions from the Institute and Faculty examinations.

Fuller details of the degree course will be provided on application to the University.

Vocational service: The majority of actuaries in South Africa are employed by life assurance companies. There are also many consulting actuaries and some who occupy full-time executive positions in mining and industry.

One of the aspects of the work of an actuary is the application of mathematical techniques, particularly in the field of probability, and to the eventualities of human life. He is, however, also concerned with the collection, processing and interpretation of statistical data and is equipped to apply them in the solution of various financial and statistical problems. The further an actuary progresses in a life assurance company, for example, the more will he also be concerned with matters such as long-term planning, co-ordination of the work of the divisions of the company, business negotiations and organisation with other companies at high level and the responsibility for decisions or recommendations in which considerable amounts of money are involved.

Although the actuary's training course is a demanding one, the remuneration is highly adequate and the opportunities virtually unlimited. According to individual merit, opportunities which are grasped and experience gained in matters of general policy and managerial responsibilities, the actuary can proceed to the position of manager or general manager of a company. The highest executive positions in life assurance companies in the country are, for example, generally filled by actuaries.

Many of the larger life offices in South Africa offer generous bursaries enabling students to study full-time at university for four years. They normally require the student to work for the life office for a number of years after completing his degree.

## 2. THE ASSOCIATION OF ACCREDITED PRACTITIONERS IN ADVERTISING

Admission qualification: The Association does not require a specific educational standard. The Witwatersrand College for Advanced Technical Education, however, requires a Standard X Certificate.

Nature and duration of the course: The course extends over a period of two years of part-time study. A maximum period of four years is, however, allowed for all the subjects to be passed and to obtain the diploma.

### Subjects

Introduction to Advertising	Marketing
Copy and Design	Market Research
Advertising, Printing and Production	Economics/Law
Media	

### Training centres

Witwatersrand College for Advanced Technical Education

Some Correspondence Colleges.

(More training centres are being planned for 1977.)

Vocational service: Modern man lives in a world in which advertising has become part of everyday life. In South Africa advertising is a comparatively young industry, but it is of a standard comparable with the best in the world, and its potential is still far from being fully exploited. Most of the smaller firms handle their own advertising, but large firms make use of the services of advertising contractors. Such contractors in their turn make use of accountancy managers, media managers, copywriters, commercial artists, photographers, public relations officers and administrative staff. At present there are about 70 advertising agencies in the country, with branches in most of the larger cities. For persons with the appropriate qualities there are opportunities to choose fields in advertising suited to their aptitude and interest and even of eventually starting their own business.

## 3. THE ASSOCIATION FOR BUSINESS MANAGEMENT

The NATIONAL DIPLOMA (BUSINESS MANAGEMENT) is accepted by this association for membership. For particulars see p. 75.

## 4. THE BUILDING SOCIETIES INSTITUTE OF SOUTHERN AFRICA (F.I.B.S. and A.I.B.S.)

Admission qualification: The Council may, at its discretion, register as a student of the Institute any person who has made application on the prescribed form for registration as a student.

Nature and duration of the course: The Institute conducts two examinations, viz the Intermediate examination and the Final examination. At the present time these examinations are held in October of each year, but the Council has power to hold them more frequently if circumstances warrant it.

The subjects are prescribed by the Council from time to time.

### The Intermediate Examination

Administration and Management  
Bookkeeping and Accounts  
Commercial Arithmetic  
Economics  
Building Society Organization  
Building Societies Act



Candidates must write a minimum of three subjects or all the subjects they still have to pass if less than three.

### The Final Examination

#### Section A

Banking and Finance  
Building Society Organization I :  
Income Tax, Valuation Procedure  
and Land Tenure  
Law of Mortgage, Pledge and Suretyship,  
including Liens

#### Section B

Accountancy  
Building Society Organization, Admini=  
stration and Procedure II  
Mercantile Law

Candidates may elect to write the examination in both sections or in either Section A or Section B separately.

### Training centres

Colleges for Advanced Technical Education  
Some Correspondence Colleges.

Vocational service: By pursuing this course, the student becomes qualified in the basic principles upon which the business world in general, and building society work in particular are based, as well as in the legal, economic and social implications of building society practice. The training is orientated in such a way that officials have a better understanding of their duties and are able to carry out their task more efficiently.

Building societies, with branch offices throughout the country, at present occupy an important place in the financial structure and provide many persons with opportu=  
nities of employment. A wide variety of posts is available but further study is required for advancement to the higher ranks.

## 5. THE FACULTY OF ACCOUNTANTS OF SOUTH AFRICA (F.A. (S.A.), F.F.B. (S.A.), A.F.B. (S.A.))

Admission qualification: Students of bookkeeping, over the age of 18 years may apply to be admitted as Registered Students.

Nature and duration of the course: The examinations in Preliminary, Intermediate and Final stages, leading to admission as Members of the Faculty, are held in June and December annually, at times and places most convenient to candidates.

#### Preliminary Examination

Accounting 1  
Business Economics  
Mercantile Law 1  
Commercial Mathematics

#### Intermediate Examination

Accounting 11  
Statistics  
Mercantile Law 11  
Auditing 1  
Company Law

#### Final Examination

Accounting 111  
Cost Accounting  
Income Tax Law and Accounts  
Auditing 11

Membership: Membership is open to bookkeepers/accountants over 18 years of age. Members may use the following initials after their names:  
F.A. (S.A.), F.F.B. (S.A.) and A.F.B. (S.A.).

Admission is by the above-mentioned examinations or proven record of experience authenticated by references, including those from Public Accountants and Auditors, plus details of other examinations written and considered of a sufficiently high level to warrant acceptance by the Faculty.

### Training centres

The Faculty offers no training itself although it conducts the examinations.

Individual subjects or groups of subjects can be studied at colleges for advanced technical education or by means of correspondence through correspondence colleges.

Vocational service: See p. 69.

## 6. THE INSTITUTE OF ADMINISTRATION AND COMMERCE OF SOUTH AFRICA (I.A.C.)

Admission qualifications: A Standard X Certificate. The Council may, however, at its absolute discretion, admit any candidate whose business experience and general educational background satisfies Council that he is qualified to undertake the requisite course of study. Only those students who have been registered members for a minimum period of three months will be permitted to write the Institute examinations.

Nature and duration of the course: There are ten Study Branches, all of which have certain subjects in common - a factor which facilitates qualification in additional Branches where the student so desires.

Students may not enter for more than seven subjects in any year and passes are cumulative. Subjects can also be taken in any order convenient to the student, provided that where the selected course of study prescribes more than one grade in any subject, a candidate may not enter for the higher grade until he has passed the lower grade examination in the same subject, e.g. a pass must be secured in Mercantile Law I before Mercantile Law II can be written.

### STUDY BRANCHES

#### ACCOUNTANCY

##### Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Commercial Mathematics OR  
Theory of Finance

##### Final - 1st Part

Accounting II  
Statistics  
Mercantile Law II

##### - 2nd Part

Company Law  
Accounting III  
Principles of Auditing

##### - 3rd Part

Cost Accounting  
Income Tax Law and Accounts  
Advanced Auditing

#### MANAGEMENT

##### Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Language

#### COMPANY SECRETARIES

##### Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Language

##### Final - 1st Part

Accounting II  
Company Law  
Mercantile Law II

##### - 2nd Part

Economics  
Principles of Auditing OR Management I  
Secretarial Practice

##### - 3rd Part

Advanced Secretarial Practice  
Two of the following:  
Income Tax Law & Accounts  
Accounting III  
Banking and Exchange

#### LOCAL GOVERNMENT

##### Intermediate

Language  
Business Economics  
Two of the following:  
Accounting I  
Mercantile Law I  
Management I

Final - 1st Part

Accounting II  
Statistics  
Mercantile Law II

- 2nd Part

Management I  
Secretarial Practice  
Company Law

- 3rd Part

Management II  
Industrial Law  
Economics

CO-OPERATIVE SOCIETIES

Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Language

Final - 1st Part

Accounting II  
Statistics  
Mercantile Law II

- 2nd Part

Co-operative Society Law I  
Co-operative Society Organization  
and Management  
Principles of Auditing

- 3rd Part

Economics  
Co-operative Society Law II  
Secretarial Practice

LIFE ASSURANCE

Intermediate

Accounting I  
Commercial Mathematics OR Theory  
of Finance  
Mercantile Law I  
Principles of Life Assurance

Final - 1st Part

Accounting II  
Mercantile Law II OR Management I  
Life Assurance Administration and  
Organization

Final - 1st Part

Principles of Auditing  
Two of the following:  
Accounting II  
Mercantile Law II  
Management II

- 2nd Part

Municipal Law I  
Economics OR Shorthand/Snelskrif  
(100 w.p.m.)  
One of the following:  
Secretarial Practice  
Cost Accounting  
Commercial Mathematics  
Statistics

- 3rd Part

Municipal Law II  
Local Government Finance  
Municipal Administration

COST ACCOUNTANCY

Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Commercial Mathematics OR Theory of  
Finance

Final - 1st Part

Accounting II  
Statistics  
Economics

- 2nd Part

Industrial Law  
Management I  
Cost Accounting

- 3rd Part

Management II  
Accounting III  
Advanced Cost Accounting

PRIVATE SECRETARIES

Intermediate

Accounting I  
Secretarial Practice  
Typewriting (35 w.p.m.)  
Language

Final - 1st Part

Accounting II  
Shorthand OR Snelskrif (100 w.p.m.)  
Economics OR Second Language

- 2nd Part

Economics  
Law Affecting Life Assurance  
Life Assurance Accounts and Returns

- 3rd Part

Selection of Lives  
Life Assurance Investments OR  
Life Assurance Premiums and  
Valuations  
Accounting III OR Management II OR  
Statistics

EXECUTORSHIP AND TRUSTEES

Intermediate

Accounting I  
Business Economics  
Mercantile Law I  
Commercial Mathematics OR Theory of  
Finance

Final - 1st Part

Accounting II  
Company Law  
Mercantile Law II

- 2nd Part

Principles of Auditing  
Income Tax Law and Accounts  
Secretarial Practice

- 3rd Part

Advanced Secretarial Practice  
Executorship Law and Accounts  
Insolvency and Liquidation Law  
and Accounts

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Vocational service: The ten fields in which the I.A.C. Diploma can be obtained offer an excellent opportunity to a person to qualify himself in a variety of spheres. A career is usually pursued in one particular direction but knowledge of related fields is always advantageous and is sometimes a requirement for promotion.

The diploma is regarded as a strong recommendation by many employers, including local authorities, throughout the country when appointments are made in responsible positions and promotions and/or increases in salary are considered. For those who have obtained the diploma, lectures, seminars and other gatherings are arranged so that they can keep abreast of important developments in their various professions. See also pp. 69 and 70.

7. THE INSTITUTE OF BANKERS IN SOUTH AFRICA (F.I.B.S.A. and C.A.I.B. (S.A.))

CERTIFICATE COURSE;

BANKERS' DIPLOMA and

TRUSTEE DIPLOMA

(i) CERTIFICATE COURSE

Admission qualification: Candidates must be elected members of the Institute before being allowed to enter for the examinations.

- 2nd Part

Typewriting (45 w.p.m.)  
Shorthand OR Snelskrif (120/140 w.p.m.)  
Mercantile Law I

- 3rd Part

Business Economics  
Company Law OR Management I  
Shorthand OR Snelskrif (100 w.p.m.) -  
whichever has not been taken in the  
1st and 2nd part Final - OR Banking  
and Exchange

LIFE ASSURANCE SELLING

Intermediate

Afrikaans or English  
Commercial Mathematics OR Theory of  
Finance  
Mercantile Law I  
Principles of Life Assurance

Final - 1st Part

Mercantile Law II  
Economics OR Management I  
Salesmanship

- 2nd Part

Law Affecting Life Assurance  
Executorship Law & Income Tax Law  
Life Assurance Premiums & Valuations OR  
Business Economics OR Company Law

- 3rd Part

Selection of Lives  
Life Assurance Investments  
Estate Planning

Nature and duration of the course: The Certificate Course is aimed at new entrants and can be completed in two sittings.

Subjects

Banking	Bank Marketing
Foreign Exchange	Business Communication OR Communication
Stocks and Shares	
Human Relations	

(ii) BANKERS' DIPLOMA

Admission qualification: Candidates must be members of the Institute.

Nature and duration of the course: The Bankers' Diploma is devised for bank personnel who have a number of years' practical experience. It consists of two parts of six subjects each and may be completed in three years if taken on a full-time study basis. At least five subjects of Part I must have been passed before a candidate is allowed to enter for Part II. It is not necessary to have passed the Certificate Course before embarking on the Bankers' Diploma.

Part I

Money and Banking I  
Management I  
Accountancy I  
Law I  
Economics I  
Income Tax OR Statistics  
Rhodesian Income Tax

Part II

Money and Banking II  
Management II  
Accountancy II  
Law II  
Economics II  
Business Economics OR Agricultural  
Economics OR Marketing

(iii) TRUSTEE DIPLOMA

Admission qualification: Membership of the Institute.

Nature and duration of the course: A specialized course directed at personnel engaged in trustee and estate work. Students need not have passed other parts of the Institute's curriculum to enter for this examination.

Subjects

Executor and Trustee Law  
Executors' and Administrators Accounts

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Vocational service: Modern banking is strongly orientated towards people and the service aspect is emphasized by every banking institution. With the introduction of computers, many routine duties have now disappeared, so that employees are able to devote their time to marketing, personalized financial services and other interesting duties. The Institute provides its members with the opportunity and stimulus for further and wider education throughout their banking career by setting professional examinations. Banks grant attractive cash bonuses to employees who pass these examinations.

8. THE INSTITUTE OF CERTIFIED BOOKKEEPERS OF SOUTH AFRICA (A.I.C.B. and F.I.C.B.)

Admission qualification: Students must be over the age of 15 years.

Nature and duration of the course: There are three levels of examination, viz: The Elementary Diplomas of the Institute which are an introduction to the work of the Institute, but confer no right of membership;

the Associate Examination, success in which examination, written and passed at one sitting, entitles a student to Associate Membership; and

the Fellowship Examination, entry to which is restricted to those who have been admitted to Associate Membership, and success in which entitles the member to Fellow Membership.

## Elementary Diplomas

Students may enter for, and write, one or more of the examinations listed below. Success will be certified by the issue of an appropriate Elementary Diploma.

Elementary Bookkeeping  
Elementary Commerce  
Elementary Commercial Arithmetic  
Elementary English OR Elementary Afrikaans

### Associate Examination

Bookkeeping  
Commerce

#### One of the following:

Commercial Arithmetic  
English  
Afrikaans

### Fellowship Examination

Accounting  
Mercantile Law

#### One of the following:

Auditing  
Income Tax  
Costing

#### One of the following:

Company Law  
Economics  
Management

## Training centres

Colleges for Advanced Technical Education  
Some Correspondence Colleges.

Vocational service: The examinations of these courses can normally be written simultaneously with the examinations of other fields of study. Particular provision is made for persons with little or no background in accountancy and the Institute endeavours to protect the reputation and interests of qualified bookkeepers, and to improve their abilities. The course is especially suitable for those engaged in all kinds of clerical work.

## 9. THE INSTITUTE OF COST AND MANAGEMENT ACCOUNTANTS (A.C.M.A. and F.C.M.A.)

Admission qualification: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with passes in English/Afrikaans and Mathematics. Students who are 31 and over and who have outstanding non-academic qualifications, such as wide practical experience and considerable seniority, may also be granted registration, at the Council's absolute discretion.

Nature and duration of the course: The course covers five parts which may be written twice yearly in May and November. Examinations may be written in either English or Afrikaans. Students study part-time.

### Foundation stage

#### Section A

Financial Accounting I  
Cost Accounting I  
Economics

#### Section B

Mathematics and Statistics  
Business Law (according to South African or United Kingdom principles)  
Organization of Production

### Professional stage

#### Part I

Financial Accounting II  
Cost Accounting II  
Economic Analysis  
Quantitative Techniques

#### Part II

Financial Accounting III  
Company Law and Taxation (according to South African or United Kingdom principles)  
Organization and Marketing Management  
Management Information Systems and Data Processing

### Part III

Management Accounting I  
Management Accounting II  
Financial Management  
Corporate Planning and Control

Practical experience: In order to become an Associate of the Institute the student must, in addition to passing the examinations, have a total of three years' practical experience of cost and management accountancy. No articles are served.

Practical in-company training schemes: Certain companies have devised practical training schemes for cost and management accountancy students so that they can obtain the necessary practical experience and earn a good salary while learning. The names of the companies which have registered training schemes with the Institute can be obtained from the Secretary of the Institute.

#### Training centres

Colleges for Advanced Technical Education  
Some Correspondence Colleges.

Vocational service: Young men and women with the inclination and who possess the necessary qualities, or persons in whom these qualities can be developed, should seriously consider becoming cost and management accountants. The occupation involves, inter alia, the following: Carrying out analytical and creative work; being part of a managerial team whose aim is the maintenance and improvement of the efficiency of the undertaking, and planning for the future; a position in which specialized knowledge and advice to others and of extreme importance; an opportunity to render a real contribution to the success of the undertaking and of the community as a whole.

The management of any business concern, and especially that of a large company, constantly strives to utilize its labour, capital, etc., to the full and to safeguard its profit margin. However, success or failure depends largely on managerial decisions, which are made in consultation with the cost and management accountant.

Candidates who take this course are not trained as cost accountants only. They are prepared, in particular, for the highest posts at the managerial level. An analysis in this regard (recent particulars as supplied by the Institute) of posts generally occupied by members of the Institute reveals the following: Managing directors, general managers, financial directors and financial controllers (28%); management accountants (16%); consultants and accountants in the public sector (13,5%); officials in administration, marketing, education (lecturers), etc. (12,5%); secretaries/accountants (mainly companies) (12%); chief accountants of groups (10%); cost and works accountants (8%).

#### 10. THE INSTITUTE OF CREDIT MANAGEMENT IN SOUTHERN AFRICA

CERTIFICATE IN CREDIT CONTROL STUDIES;

DIPLOMA IN CREDIT MANAGEMENT, and

CERTIFICATE IN CREDIT MANAGEMENT STUDIES

#### Registration

- Every applicant for registration under the age of 21 must produce evidence of having reached matriculation standard.
- Applicants over the age of 21 are not bound by this regulation but must satisfy the Institute that the nature of their employment and general educational background justify registration.
- Applicants must be not less than 18 years of age on the first day of the first examination to be written.
- The application forms must indicate that, at the time of the application, the applicant is engaged in the office of a trading concern, or is bona fide in the course of preparation with the object of adopting the profession of Credit Management as his chief occupation after passing the examinations.

- The application forms must bear the recommendation of a member of the Institute or an approved official of the applicant's employer for admission to the examinations of the Institute.

(i) CERTIFICATE IN CREDIT CONTROL STUDIES

Admission qualification: Those eligible to write this course shall have attained the Junior Certificate (Standard 8) in South Africa or the Rhodesian Certificate of Education.

Nature and duration of the course: The course leads to Ordinary Membership. All four subjects will be written at one sitting in May or November. Credits will be allowed where a minimum of two subjects are passed at the sitting. The course must be completed within two years.

Successful completion of the Certificate Course will allow the student entry to the Diploma Course in Credit Management.

Subjects

Business Administration	*Elementary Bookkeeping (Optional subject for those students with no prior knowledge or experience.)
Human Relations	
Communication	
Credit Management	*Credit will be given if this subject has been passed.

(ii) DIPLOMA IN CREDIT MANAGEMENT

Admission qualification: Students under twenty-one years who have completed the Certificate in Credit Control Studies, or have attained a Standard X Certificate, will be admitted to the course.

Where applicants may have other qualifications, exemption may be applied for on a subject by subject basis. No exemption from the Credit Management subjects will be considered. Where the applicant is of a reasonably advanced age and has had sufficient practical Credit Management experience to justify it, exemption from the normal entry requirements may be waived at the discretion of the Governing Council of the Institute.

Nature and duration of the course: The course leads to Associate Membership. All four subjects of one part to be written at one sitting in May or November. Credits will be allowed where a minimum of two subjects are passed at the sitting.

The whole of Part I to be completed in three sittings and the whole of Part II in four sittings.

Part I

Credit Administration I  
 Financial Accounting  
 General Principles of South African or Rhodesian Law  
 Economics

Part II

Credit Administration II  
 Commercial Law (S.A. or Rhodesian)  
 Management  
 Special Statutes (S.A. and/or Rhodesian)

(iii) CERTIFICATE IN CREDIT MANAGEMENT STUDIES

Admission qualification: This course is available to any applicant employed in the field of Credit Management, but will not lead to exemption from any of the requirements for the Certificate in Credit Control or the Diploma in Credit Management.

Nature and duration of the course: The course is designed basically as a refresher course for persons holding positions in Credit or, in certain cases, as a means of elevation to Associate Membership.

All three subjects may be written at one sitting. Credit will be given if two subjects are passed, providing the applicant is successful in the remaining subject at the next sitting.

Subjects

Credit Administration I  
 Credit Administration II  
 Special Statutes



### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Vocational service: Credit Management has been defined as the managerial function of granting, rejecting or withholding of credit in accordance with company policy and the controlling and prompt collection of accounts receivable. Credit is involved, in varying degrees, in almost every trading or financial undertaking and the scope for those engaged in, or entering into, the field of Credit Management is wide and varied. Throughout the world credit is playing an increasing part in the economy of nations and the knowledge required by Credit Managers is becoming so specialised that the demand for suitably trained persons outstrips supply.

A career in Credit Management is as fully rewarding as any other branch of professional management and, because of its essential involvement in human relationships, is one which offers a constantly changing challenge. The field of application is wide: from banks and building societies, financial and allied institutions, giant industrial and commercial concerns and wholesale houses to the smallest retailer. All seek or extend credit in one or more of its many forms.

Concerns are becoming increasingly aware of the vital part played by credit in the formulation of policies and the successful Credit Manager must now be involved in top management teams and policy-making bodies. On him devolves the responsibility of advising the need to relax, restrict or amend credit policies and of balancing the efficient administration of his credit policies against the needs of his customers, in particular to ensure that the customer does not commit himself beyond prudent limits.

An efficient Credit Manager directly contributes to the financial stability not only of his own concern but of the country as a whole.

## 11. THE INSTITUTE OF MARKETING MANAGEMENT

### DIPLOMA IN MARKETING MANAGEMENT

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years of part-time or full-time study. The examination is in three parts.

#### Part I

Marketing I  
Economics for Marketing  
Management and Organization  
Communication in Marketing  
Statistics

#### Part II

Marketing II  
Consumer Behaviour  
Legal Aspects of Marketing  
Management and Cost Accounting

#### Part III

Marketing III  
Market Research and Forecasting  
Market Systems and Control  
Advertising and Sales Promotion

### Training centres

Colleges for Advanced Technical Education  
Some Correspondence Colleges.

Vocational service: The Institute takes the view that each undertaking identifies and evaluates the requirements of its clients and equips itself accordingly, so that those requirements can be satisfied at a particular profit. The aim is consequently not only to establish the diploma as the accepted standard for academic education in marketing, but to allow it to serve as a prerequisite for marketing management and the accompanying responsibility.

Members of the Institute and consequently those who are directly involved in the various spheres of marketing, are kept abreast of the most recent marketing methods. They are also offered the opportunity of extending their professional skills and powers of judgement. For these persons, who have also gained the necessary experience in the course of time, a career in the field of marketing and marketing management can lead to the highest posts at the managerial level. See also p.69.

12. THE INSTITUTE OF PERSONNEL MANAGEMENT (SOUTHERN AFRICA)

INTERMEDIATE DIPLOMA IN PERSONNEL MANAGEMENT;

INTERMEDIATE DIPLOMA IN TRAINING MANAGEMENT;

ADVANCED DIPLOMA IN PERSONNEL MANAGEMENT, and

ADVANCED DIPLOMA IN TRAINING MANAGEMENT

Admission qualifications

- Intermediate Diplomas: Students must be members of the Institute of Personnel Management (Southern Africa) (IPM). There is no minimum educational standard. A simple comprehension test is offered to enable potential students to assess for themselves whether they have the level of understanding necessary for successful completion of the course.
- Advanced Diplomas: Students must have completed the requirements for one of the Intermediate Diplomas before commencing study for an Advanced Diploma.
- Individual Subjects: Students may study individual subjects for non-diploma purposes without becoming members of IPM.

Nature and duration of the courses: Courses are designed around the Learner Controlled technique which enables a student to study at his own pace. Duration of the course is dependent on the student's ability to absorb information. On the average the Intermediate Diplomas can be completed in 18 months and the Advanced Diploma after a further 24 months' study.

Students are required to submit assignments on preselected topics during their period of study. Examinations are held in May/June and October/November each year. Both assignment marks and examination performance are taken into account in determining whether a student has passed a subject. Success in each subject is acknowledged by the issue of a certificate.

Subjects

	<u>Personnel Diploma</u>	<u>Training Diploma</u>	
Aid Subject:	Learner-Controlled Study	and techniques	INTERMEDIATE
Introductory Subject:	Introduction to Personnel and Training		
Specialised Subjects:	Manning Safety, Health and Welfare Salary and Rewards Industrial Legislation	Training Management Training Techniques and Aids Management and Supervisory Development Special Training Situations	A D V A N C E D
Common Subjects:	Productivity Motivation Organisation Development In-company Consultancy and Counselling Manpower Planning Management Management Accounting Introduction to Statistics		
	Personnel project	Training project	

### Training centre

By correspondence with IPM. Study groups have been formed by students in some centres to assist in maintaining a disciplined study schedule. Arrangements are at present being made to enable students to attend lectures on either a part-time or a full-time basis.

Vocational service: The aim of the diploma course is to establish an accepted standard for academic education in personnel and to allow it to serve as a prerequisite for personnel management and the accompanying responsibility. A pass in these examinations is no proof, however, of specialisation or suitability for a particular branch of the personnel field, but indicates a standard of knowledge of the principles of personnel and training management and the application thereof. Adequate practical experience must supplement the theoretical knowledge gained.

The Institute of Personnel Management (Southern Africa) is active in the promotion of personnel management and the better utilization of labour in Southern Africa, and in addition to the diploma course it offers a wide range of activities in which members may gainfully participate.

A limited number of bursaries are available. Application forms may be obtained from the IPM office. The knowledge gained by study of the diploma has been recognised by employers as being of value and many organisations assist students financially.

### 13. THE INSTITUTE OF SOUTH AFRICAN SHIPBROKERS (F.I.S.A.S. AND A.I.S.A.S.)

Admission qualification: Students must apply to the Council of the Institute for permission to sit for the examinations as set by the Institute.

Nature and duration of the course: There are two examinations, viz the Associate Examination and the Fellowship Examination.

#### Associate Examination

Maritime Geography  
Law and Chartering  
The Ship  
Customs House Work  
General Questions  
Marine Insurance, Elementary  
Viva Voce

The candidate who wishes to become an Associate of the Institute must be a South African citizen; at least 21 years of age; have been engaged in the business or profession of a shipbroker in Southern Africa or elsewhere for a period or periods aggregating at least three years and be so engaged at the time of his application, and have passed the Associate Examination.

#### Fellowship Examination

Maritime Geography  
Chartering  
Sale and Purchase  
Bookkeeping  
Elementary Banking and Foreign Exchange  
The Principles of Voyage Estimating  
Marine Insurance (extended syllabus)

### Training centre

School of Accountancy and Business Studies, Cape Town.

Vocational service: Shipbrokers act as intermediaries in the loading or selling of ships. However, the broad scope of actions which must be taken to provide ships with cargoes and related matters which must be dealt with, demand a high degree of specialized knowledge which can only be obtained by thorough training.

The primary aim of the Institute is to promote the interest and welfare of all persons involved in the profession or business of shipbrokerage in Southern Africa and

the improvement of their professional status, with a view to maintaining a high standard of professional conduct and procedures. Any member of the Institute who wishes to obtain a position in the profession, can advise the secretary by using the prescribed form. The latter will then place the pupil's interest on record. Related companies and other persons who are interested in personnel can then enter into negotiations with the secretary.

14. THE INSURANCE INSTITUTE OF SOUTH AFRICA

Admission qualification: A Standard X Certificate. Candidates who are not in possession of a suitable Standard X Certificate and who are over the age of 25, may in exceptional cases be permitted direct entry to the Qualifying Examination (Associateship). This will, however, be at the discretion of the Registration Committee.

Introductory Examination

Candidates who are not accepted on the grounds of age and experience may be permitted to enter for the Introductory Examination. The subjects are: English or Afrikaans; Economic Organization; Principles of South African Law; Elements of Insurance. Candidates will be required to pass all four subjects within three years before they will be permitted to proceed to the Qualifying Examination.

Nature and duration of the course: There are two levels of examination leading to the two diplomas, viz the Qualifying Examination for the Associateship Diploma and the examination for the Fellowship Diploma. The time limit for completion of the examinations for the Associateship Diploma is six years. There is no time limit for completion of the Fellowship qualification.

(i) Associateship Diploma

Students select one of the five branches mentioned below and complete the subjects in the sequence indicated.

Subjects common to all five branches

Elements of Insurance  
Legal and economic aspects of insurance

General

Insurances of the person  
Property and pecuniary insurances  
Insurances of liability (a)  
Motor insurance practice OR  
Engineering Insurance  
Liability Insurance (b)  
Property Insurance (underwriting and claims)  
One of:  
Life assurance  
Property insurance (assessment of the risk)  
Consequential loss insurance

Life

Insurances of the person  
Property, pecuniary and liability insurances  
Life assurance  
Taxation, social security and business insurance  
Legal aspects of life assurance  
Mathematical basis of life assurance  
Staff pension and assurance schemes

Motor and Liability

Insurances of the person  
Property and pecuniary insurances  
Insurances of liability (a)  
Motor insurance practice  
Engineering Insurance OR  
Motor insurance administration  
Liability insurance (b)  
Liability insurance claims

Property

Insurances of the person  
Property and pecuniary insurances  
Insurances of liability (a)  
Property insurance (assessment of the risk) I  
Property insurance (assessment of the risk) II  
Property insurance (underwriting and claims)  
Consequential loss insurance

### Marine and Aviation

Insurances of liability and of the person	Marine law OR Aviation law
Property and pecuniary insurances	Marine underwriting OR Aviation underwriting
Economic Geography	Marine insurance claims OR Aviation insurance claims
Marine and aviation: risk assessment	

#### (ii) Fellowship Diploma

Finance, investment and management accounting  
Management of human resources  
Management techniques and statistics OR Marketing and statistics

#### Training centre

Correspondence courses provided by the Insurance Institute of South Africa.

Vocational service: The nature of insurance and the functions of insurance companies need no introduction in today's world. However, few people realize that careers in insurance involve a great deal more than selling insurance policies and the activities accompanying that. Insurance also offers numerous other opportunities, with ample challenge. In fact, an insurance company nowadays offers the fastidious job-seeker under one roof a variety of career opportunities that can satisfy practically any set of aptitudes and interests. In addition to this the unprecedented growth and development of the past decade has compelled insurance companies to enter new fields, establish subsidiary companies, open new offices and appoint many new employees. All this brings new and challenging jobs and ample opportunity for the realization of personal talent.

#### 15. THE NATIONAL OCCUPATIONAL SAFETY ASSOCIATION

The NATIONAL DIPLOMA IN SAFETY MANAGEMENT is recognized by this Association as a professional qualification in Safety Management.

For particulars see p. 85.

#### 16. PUBLIC RELATIONS INSTITUTE OF SOUTH AFRICA

Admission qualification: A Standard X or equivalent certificate.

Nature and duration of the course: The course extends over two years and is offered on a part-time basis.

#### Intermediate Examination

The nature of Public Relations  
The practice of Public Relations  
Research and Planning  
Press and Radio Relations  
Printed Material  
Visual and Audio-visual aids  
Oral Communication  
Written Communication  
Special events

#### Final Examination

The final examination is designed to test a candidate's knowledge, experience and judgement as a practitioner in public relations. He will be required to show that he is generally well-informed, that he understands the underlying purposes and principles of public relations and can apply them to the diagnosis and solution of particular problems in different fields, and that he is capable of planning and carrying out a complete public relations operation.

Candidates are advised to study the basic premises of public relations and acquire a background knowledge of subjects that might be useful for the effective practice of public relations, inter alia the following: The formation of public opinion, evaluation of media and principles of management.

The Final Examination consists of two three-hour papers and an oral examination.

#### Training centres

Colleges for Advanced Technical Education.

Vocational service: It is the function of public relations work to achieve a good name for an organization by improving relations between the organization and the persons serving it and those who are affected by the organization's activities. In this way the goodwill, trust and support of the public are obtained and there is certainty that the policy and actions of the organization are acceptable to the public. In order to achieve this aim, use is made of all the modern means of communication. However, the public relations officer's function remains the most important. The quantity and variety of personal qualities which are necessary for success in public liaison work, are probably more than those required in most other occupations.

In South Africa this occupation has only assumed its present proportions during recent years, mainly as a result of the Institute's attempts to explain to managements what advantages can be gained by the business world in the application of the principles of public relations work. There is room for further growth but, in the nature of things, public relations work will always be a small occupation, compared with others such as advertising, sales promotion and marketing. Competition for entry into the occupation is extremely strong and only a handful of persons with exceptional personal qualities and thorough training can hope to advance to the executive level in this extremely interesting and challenging occupation.

#### 17. THE SOUTH AFRICAN ASSOCIATION OF CERTIFIED SECRETARIES (F.A.C.S. (S.A.) AND A.A.C.S. (S.A.))

Admission qualification: The professional examinations are open to all registered students, who must be over 16 years of age and have passed the preliminary or equivalent examination, or have the requisite experience.

Nature and duration of the course: There are three examinations to qualify as a Certified Secretary (SA).

The Preliminary examination is the first stage and is a test of general education. Exemption from this examination can be granted to those in possession of a Standard X Certificate or who have passed other examinations approved by the Association.

The Intermediate and Final examinations are tests of professional training in the specified subjects and must be completed within five years of registration as a student.

#### Preliminary Examination

English OR Afrikaans  
Arithmetic  
History OR Geography  
One of the following:  
Mathematics  
Latin OR French

#### Intermediate Examination

Secretarial Practice  
Bookkeeping and Accounts  
Three of the following:  
English OR Afrikaans  
Mercantile Law  
Company Law  
Commercial Arithmetic

#### Final Examination

Secretarial Practice  
Advanced Bookkeeping and Accounts  
Three of the following:  
Economics  
Company Law  
Mercantile Law  
Banking and Exchange

Membership: Persons can be admitted as Associates or as Fellows. Admission is by the above-mentioned examinations or proven record of experience authenticated by references, including those from Public Accountants and Auditors, plus details of other examinations written and considered of a sufficiently high level to warrant acceptance by the Association.

Training centres

The Association offers no training itself although it conducts the examinations.

Individual subjects or groups of subjects can be studied at colleges for advanced technical education or by means of correspondence through correspondence colleges.

Vocational service: See p. 70.

18. THE SOUTH AFRICAN INSTITUTE OF MANAGEMENT

Admission qualifications: Candidates who do not hold a Standard X Certificate must write not more and no fewer than three subjects at the first sitting of the Intermediate examination. Candidates in possession of a Standard X Certificate or higher qualifications may write all five subjects at one sitting.

Nature and duration of the course

Intermediate Examination

Economics  
Management Introduction  
Legal Aspects of Commerce and Industry  
Financial and Cost Accounting  
Statistics

Final: Part A

All subjects may be written at the first sitting. Credit will only be given for individual subjects if at least two subjects are passed at a sitting.

Management Principles and Practice  
Production  
Procurement  
Marketing

Final: Part B

All three subjects in Part B may be written at the first sitting. Credit will be given for individual subjects if at least two subjects are passed at one sitting.

Management Control  
Business Finance  
Personnel Management

Training centres

Colleges for Advanced Technical Education  
Some Correspondence Colleges.

Note: The colleges for advanced technical education also offer the course for the Institute's Diploma in Advanced Management.

Admission requirements: A university degree, a national diploma or membership (by virtue of examinations) of a recognized professional institute. Inquiries with regard to this course must be addressed direct to the Institute.

Vocational service: The course in management is not limited to matriculants, and candidates who are already in the practical situation are, subject to certain conditions, admitted to the course to qualify themselves further in management. The Institute states clearly that this course must be regarded as the normal supplementary basis for the pursuit of managerial practice. A pass in these examinations is no proof of specialization in or suitability for a particular branch of management, but indicates an advanced standard of knowledge of principles of management and of the general and functional application thereof. Before being admitted to professional membership, successful candidates must also provide proof of adequate practical experience in the business world.

Also see p. 69.

19. THE SOUTH AFRICAN INSTITUTE OF ORGANIZATION AND METHODS

The NATIONAL DIPLOMA (ORGANIZATION AND METHOD STUDY) is accepted by this Institute for membership.

For particulars see p.82.

20. THE SOUTH AFRICAN INSTITUTE OF PRINTING

The NATIONAL DIPLOMA (PRINTING MANAGEMENT) is accepted by this Institute for membership.

For particulars see p. 83.

21. THE SOUTH AFRICAN INSTITUTE OF SUPERVISORY MANAGEMENT

The NATIONAL CERTIFICATE IN SUPERVISORY MANAGEMENT is accepted by this Institute for membership.

For particulars see p. 90.

22. THE SOUTH AFRICAN INSTITUTE OF VALUERS

The NATIONAL DIPLOMA (PROPERTY VALUATION) is accepted by this Institute for membership.

For particulars see p. 84.

23. THE SOUTHERN AFRICAN INSTITUTE OF CHARTERED SECRETARIES AND ADMINISTRATORS (A.C.I.S. and F.C.I.S.)

Admission qualifications: Students who wish to take this course, must comply with the following requirements:

They must be not less than 16 years of age and must hold a Matriculation or Matriculation Exemption Certificate. Students over 23 are not bound by this regulation, but must satisfy the Institute regarding their educational background (broadly speaking a Standard X Certificate) and the nature of their employment during the past three years.

Nature and duration of the course: The whole course usually extends over three years on a full-time basis and four years on a part-time basis. All the subjects of a section must be passed at one examination sitting.

PART A	Section 1	Communication General Principles of S.A. Law
	Section 2	Principles of Economics Financial Accounting I
PART B	Section 1	Business Administration I Commercial Law
	Section 2	Statistics Company Law (South African or Rhodesian)
PART C	Section 1	Company Secretarial Practice Law and Procedure of Meetings
	Section 2	Financial Accounting II



PART C                    Section 2 (Continued)             One of the following subjects:  
Taxation (South African or Rhodesian)  
Law of Employment (South African or  
Rhodesian)  
Management Accounting  
Administration of Estates

PART D    Personnel: Principles and Policy  
Business Administration II  
Economic Policies and Problems  
Financial Accounting III

Licentiate

The grade of Licentiate which is, however, not a grade of membership, is open to those who have completed the examination successfully but have not completed the required period of qualifying service of six years in the office of an organization.

Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges  
Some Correspondence Colleges.

Note: The Corporation of Secretaries merged with the South African Institute of Chartered Secretaries and Administrators on 1 April 1970.

Vocational service: Under normal circumstances it is the duty of a Chartered Secretary to ensure that the affairs of his organization are managed in accordance with the legal requirements as stipulated in the Companies Act and other appropriate statutes. His task will involve the organization of meetings of members and directors and the keeping of minutes, as well as the responsibility of ensuring that decisions are carried out correctly.

In addition it is highly probable that the Chartered Secretary will be responsible for matters such as financial management, office administration, personnel affairs and so forth.

The Chartered Secretary may occupy a position such as company secretary or as administrative or financial manager of a commercial undertaking, or he may be appointed as a senior administrative official in banks, building societies, insurance companies, municipalities and other organizations. In some organizations he may be employed as accountant, personnel officer, or organization and methods officer.

## CHAPTER IV

### OTHER COURSES AND TRAINING SCHEMES OFFERED BY COLLEGES FOR ADVANCED TECHNICAL EDUCATION, TECHNICAL COLLEGES AND OTHER INSTITUTIONS

#### A. ART AND DESIGN

##### 1. NATIONAL DIPLOMA IN ART AND DESIGN

General remarks: All the courses must be taken at institutions authorised by the Department of National Education to provide these courses and to prepare candidates for the examinations. Only candidates who have completed the course concerned at a recognized training centre will be permitted to enter for the examinations for such a diploma.

Credit is accorded for single subject successes, and subject successes can be accumulated until a full diploma has been obtained.

A National Diploma in Art and Design is issued by the Department in the following specialized fields: Ceramics, Dress Design, Fine Art, Graphic Design, Industrial Design, Interior Design, Textile Design.

Admission qualifications: A Standard X Certificate or equivalent. A candidate who has not passed in both the official languages (Standard X or equivalent) must obtain a pass in the outstanding language(s) at either the Diploma level or Standard X level, before a Diploma will be awarded. In certain cases candidates who do not hold the minimum admission qualifications, may be granted conditional admission provided that such candidates obtain the required qualification before a Diploma is issued. Further particulars about this will be furnished by the training institutions on request.

Nature and duration of the courses: The courses all extend over three years. All students follow the one-year Basic Course with the exception of those taking Dress Design and Industrial Design. The five other courses thus extend over two years after completion of the Basic Course. Some subjects extend over only one or two years, but for the purpose of this publication these details have been omitted. All the courses are offered on a full-time basis.

##### BASIC COURSE

This course extends over a period of one year and the subjects are examined internally by the training centres.

##### Subjects

Group I : Art of Drawing

Group II : History of Art

Group III : Visual Studies; Perceptual Studies, Form and Colour Studies, Space and Volume Studies, Graphic Interpretation

This course is very important since it orientates the students and offers them the opportunity to decide in which field their talents and interests lie.

##### Training centres

Colleges for Advanced Technical Education: Cape Town, Durban, Port Elizabeth, Pretoria

Technical Colleges: Bloemfontein, East London

The College of Art, Johannesburg.

SPECIALIZED FIELDS: NATIONAL DIPLOMAS

(i) CERAMICS

A career for persons who wish to follow a profession as a potter in a studio or a designer in a ceramic factory.

Subjects for the second and third years

Group I : Art of Drawing (Part B only)

Group II : History of Art  
History of Ceramics

Group III : Ceramic Design  
Ceramic Modelling

Group IV : Ceramics (Practical)

Group V : Ceramic Science

Training centres

Colleges for Advanced Technical Education: Durban, Pretoria

The College of Art, Johannesburg.

(ii) DRESS DESIGN

A course for persons who are interested in dressmaking and fashion design.

Subjects for the three years of the course

Group I : Art of Drawing  
Fashion Drawing

Group II : History of Costume

Group III : Creative Dress Design  
Dressmaking: Cutting  
Dressmaking (Practical)  
Millinery

N.B.: Millinery is a one-year course only, and no examination is conducted.

Training centres

Colleges for Advanced Technical Education: Durban, Port Elizabeth, Pretoria.

(iii) FINE ART

A course for persons who wish to follow a profession in fine art (painting, sculpture or graphic art).

Subjects for the second and third years

Group I : Art of Drawing

Group II : History of Art

Group III : Painting  
Composition Painting  
Figure Painting

OR

Sculpture  
Composition Sculpture  
Figure Sculpture

OR

Graphic Art  
Graphic Composition  
Graphic Illustration

Group IV : General Painting and/or  
General Sculpture and/or  
General Graphic Art  
Advanced Crafts

### Training centres

Colleges for Advanced Technical Education: Cape Town, Durban, Port Elizabeth, Pretoria

Technical Colleges: Bloemfontein, East London

The College of Art, Johannesburg.

### (iv) GRAPHIC DESIGN

A course for artists, e.g. in advertising layout, design, illustration, art reproduction and photography in the employ of advertising and art agencies, printers and publishers, manufacturers and some government departments.

#### Subjects for the second and third years

Group I : Art of Drawing

Group II : History of Art  
History of Graphic Design

Group III : Advertising layout  
Showcard and Poster Design  
Package and Label Design  
Lettering

Group IV : Typography (Practical)  
Photography (Practical)  
General Graphic Art or  
General Painting or  
General Sculpture  
Commercial Illustration

Group V : Theory of Reproduction Processes

### Training centres

Colleges for Advanced Technical Education: Cape Town, Durban, Port Elizabeth, Pretoria

Technical Colleges: Bloemfontein, East London

The College of Art, Johannesburg.

### (v) INDUSTRIAL DESIGN

A course for a person with an ability for creative design and who can realise it especially in industry or as a free-lance designer.

#### Subjects for the three years of the course

Group I : Art of Drawing  
Drawing Office Practice  
Presentation Drawing  
Figure Study

Group II : History of Art  
History of Industrial Design

Group III : Product Design  
Package and Label Design

Group IV : Creative Machine Setting  
Prototypes  
Typography (Practical) and  
Lettering  
Ceramics (Practical) B  
Textiles (Practical)  
Three-dimensional Design

Group V : Factory Administration and Marketing  
Production Processes of Materials

### Training centre

The College of Art, Johannesburg.

(vi) INTERIOR DESIGN

A course for persons who wish to follow a profession in interior design (interior design, display design and stage design).

Subjects for the second and third years

- Group I : Presentation Drawing  
Interior Drawing
- Group II : History of Art
- Group III : Interior Design  
Display Design  
Stage Design
- Group IV : Modelmaking  
Photography (Practical)  
Typography (Practical)  
Design Research
- Group V : Theory of Materials  
Lighting Practice

Training centres

Colleges for Advanced Technical Education: Durban, Pretoria  
The College of Art, Johannesburg.

(vii) TEXTILE DESIGN

A course specially intended for persons in the textile industry with a distinctive touch and originality of approach.

Subjects for the second and third years

- Group I : Art of Drawing  
Ornamental Design
- Group II : History of Art  
History of Textiles
- Group III : Textile Design
- Group IV : Printing (Practical)  
Illustration (Textiles)
- Group V : Theory of Textiles

Training centres

Colleges for Advanced Technical Education: Durban, Port Elizabeth, Pretoria.

2. NATIONAL HIGHER DIPLOMA IN ART

Admission qualification: A National Diploma in Art and Design or a National Diploma in Photography or a B.A.(F.A.) degree or a recognized equivalent qualification. Candidates are selected for admission.

Nature and duration of the course: The course extends over one year of full-time study or two years of part-time study. The course consists of special practice and research in the selected field of study approved by the College. A candidate must submit a proposed programme of work to the selection panel for approval within one month of commencing the course.

Training centres

All colleges offering the diploma course in the field of intended specialization, may offer the course.

Vocational service: The largest employers of persons with training in one of the above-mentioned fields are in commerce and industry. They are becoming conscious of the value of artists in industry and it is expected that the demand for trained artists will increase as a result of the rapid industrial growth experienced in the

country. There are also opportunities for free-lance work for those with above-average talent and perseverance.

The Design Institute (SA Bureau of Standards) makes bursaries available to promising students and organizes competitions with prizes, for example, which are equivalent to the costs of the study concerned in overseas countries. The aim of these competitions is to draw attention to South Africa's creative design ability and to indicate the highlights which have recently been attained in this field.

## B. P E R F O R M I N G   A R T

### 1. NATIONAL DIPLOMA IN PERFORMING ART

The National Diploma in Performing Art may be obtained in the following fields: Dramatic Art, Instrumental Music, Opera and Theatrical Art.

Admission qualification: A Standard X Certificate or equivalent.

#### Additional qualifications

Dramatic Art: The candidate must succeed in an audition in which he/she delivers a monologue and a poem of his/her own choice, as well as in a test in improvisation and sight reading.

Instrumental Music: The candidate must succeed in an audition in which he/she performs two contrasting works of his/her own choice on the chosen instrument and of which the standard is equivalent to works prescribed for the Grade VIII examination of UNISA.

Opera: The candidate must succeed in an audition in which he/she must sing three arias of his/her own choice and do a test for aptitude in acting.

Candidates must themselves arrange for the required audition at the College.

Conditional admission: Interested persons who are not in possession of a Standard X or equivalent certificate may in certain cases also be admitted to the course. More particulars in this regard may be obtained from the College.

Nature and duration of the courses: The courses for all four diplomas extend over three years on a full-time basis. However, the Diploma in Opera may also be obtained on a part-time basis.

The subjects for each of the four fields are the following:

#### (i) DRAMATIC ART

Speech	Basic Principles of Production
Interpretation	Production
Practical Interpretation in Home Language	Comedy Acting
Practical Interpretation in Second Language	Art of Make-up
History and development of Acting and Theatrical Studies	History of Drama
Applied Theatrical Studies	Text Analysis

#### (ii) INSTRUMENTAL MUSIC

Main instrument chosen from: Piano, Violin, Viola, Cello, Double Bass, Recorder, Flute, Oboe, Clarinet, Bassoon, French Horn, Trumpet, Trombone	Orchestral playing (if the main instrument is not piano or recorder)
Practical musicology	Harmony
Ensemble playing	Counterpoint
Prima Vista	Form
	History of Music
	Basic Principles of Music
	Piano literature (if the main instrument is the piano)

N.B.: Students who choose a stringed or wind instrument must take the piano as their second instrument, while students who choose the piano as their main instrument may take any one of the above-mentioned stringed or wind instruments as the second instrument.

(iii) OPERA

Practical Singing  
Ensemble Singing  
Opera Production  
History and Appreciation of Opera  
Theatrical Movement and Theatrical  
Dancing  
Acting  
Fencing

Practical Speech  
Applied Theatrical Studies  
Ear Tests  
Sight Reading  
General Theory of Music  
Practical languages: Italian and  
German  
Piano  
Science of Lieder

(iv) THEATRE CRAFTS

History and Development  
of Acting and the Theatre  
Basic Principles of Production  
History of Drama  
Text Analysis  
History of Costume and Decor  
Theatre Organization and Administration

Theory of Lighting Practice  
Lighting and Sound  
Stage Management  
Building of Decor and Painting  
Manufacture of props  
Art of Make-up

Training centre

Pretoria College for Advanced Technical Education.

Vocational service: The training for these diplomas mainly prepares candidates for a career in the service of the Performing Arts Councils of the four provinces. There are also opportunities with the SABC (radio and television) and in the film industry.

2. OTHER TRAINING IN MUSIC AND SPEECH

Some colleges for advanced technical education and technical colleges offer training in music and speech with a view to the written and practical examinations of various examining bodies.

The general admission requirement is a Standard X Certificate, while the duration of the courses will depend largely on the student's progress.

The following are some of the qualifications which may be obtained:

Royal Schools of Music

Teacher's Licentiate in Music (L.R.S.M.)  
Performer's Licentiate in Music (L.R.S.M.)

Trinity College of Music, London

Teacher's Licentiate in Music (L.T.C.L.)  
Performer's Licentiate in Music (L.T.C.L.)

Unisa

Teacher's Licentiate in Music (U.T.L.M.)  
Performer's Licentiate in Music (U.P.L.M.)  
Teacher's Licentiate in Theory of Music (U.T.L.M.)

Higher Speech Diploma  
Final Speech Diploma  
Licentiate in Speech

Information on the syllabuses may be obtained direct from the examining body concerned.

Vocational service: Candidates are mainly prepared for a career as a music teacher with his/her own studio. If the additional requirements for teacher training are satisfied, it is possible to obtain an appointment in the service of an education department. There are also opportunities in the fields of radio, television and the film industry.

3. CONSERVATOIRE FOR MUSIC, PRETORIA

N.B.: The courses of the Conservatoire are offered through the medium of Afrikaans only.

(i) DIPLOMA B FOR TEACHERS IN MUSIC

Admission qualifications: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) or a School-leaving Certificate.

A candidate must, at the commencement of his first year and by means of a practical test, convince the lecturer concerned that his skill in the performing art as well as his musicality and general knowledge of music justifies his admission to the study. If the pupil is unable to furnish proof in this regard, he is accepted for the preparatory course only.

Nature and duration of the course: The course normally extends over a period of three years' full-time study. From the second year, a candidate may change his Subsidiary subject to a second Major subject - Diploma B, which means, however, that his study is prolonged by one year.

First year

Harmony I  
History of Music I  
General Musicology I  
Methodology I (of the practical major subject and basic musical education for the child)  
Attendance at Choir and Practical classes  
Practical Music Studies - Major subject  
Practical Music Studies - Subsidiary subject

Second year

Harmony II  
Counterpoint I  
History of Music II  
Form I  
General Musicology II  
Practical Musicology II  
Methodology II (of the practical major subject)  
Attendance at choir and Practical classes  
Practical Music Studies II - Major subject  
Practical Music Studies II - Subsidiary subject

Third year

History of Music III  
Harmony III  
Counterpoint II  
Form II  
General Musicology III  
Practical Musicology III  
Methodology III (of the practical major subject)  
Attendance at choir and Practical classes  
Practical Music Studies III - Major subject  
Practical Music Studies III - Subsidiary subject

(ii) DIPLOMA A FOR TEACHERS IN MUSIC

Admission qualifications: As for Diploma B, above.

Nature and duration of the course: The course normally extends over four years. From the second year a candidate may change his Subsidiary subject to a second Major subject - Diploma B, which means, however, that this must also include the methodology of that instrument.

The syllabuses for the first, second and third years are the same as for Diploma B.

Fourth year

History of Music IV  
Form III  
Methodology IV (of the practical major subject)  
Practical Musicology IV  
Composition I  
Practical Music Studies - Major subject  
Practical Music Studies - Subsidiary subject



(iii) HIGHER CONSERVATOIRE DIPLOMA FOR LECTURERS IN MUSIC

Admission qualification: Only those persons who have satisfied the requirements for Diploma A two years previously may take part in this examination.

Nature and duration of the course: All that is required is participation in an examination which consists of theoretical and practical parts.

The examination may be written in the following two ways:

- (a) In two parts which are conducted exclusively orally and which, after successful participation, result in the attainment of the H.C.D.
- (b) In three parts which are likewise conducted exclusively orally but of which two must be done in public. The successful candidate is awarded the "H.C.D. with soloistic distinction", which means that he/she possesses soloistic qualities.

N.B.: The theoretical requirements are the same for both, while the practical programme also imposes the same demands, except that candidates who take part in the examination mentioned under (b) must be able to perform at least six works by heart and in public.

Theoretical part

Extensive questions will be put on

- the educational value of music teaching
- music teaching as an aid in psychological problems
- methods in musical education
- comparative views on the various old and new methods of teaching the candidate's instrument
- the candidate's own method and his reasons for the deviations which may possibly underlie his approach
- classification of works which were not known to him/her previously
- the improvement of faulty methods and adaptation to a better method
- practice methods and adaptation thereof to the more virtuoso works and the mastery of specific technical problems in higher technique (Etudes of Chopin; Liszt, Scriabine, Debussy and others)
- the individual's pedagogical approach
- concepts of style in general and the adaptation thereof to the candidate's main instrument.

Practical part

The requirements for each separate instrument are mentioned in special lists and are subdivided as follows:

- i. Scales, chords and arpeggios. Mainly "double grip technique".
- ii. Five etudes of the virtuoso style.
- iii. Polyphonic works, three in number.
- iv. Sonatas and concertos, three in number.
- v. Performing pieces of various styles, five in number.
- vi. Sight reading of a piece of the degree of difficulty of the VIIth grade.
- vii. Transposing a semitone and a tone higher or lower.

A sub-minimum of 60 per cent is required for Subdivisions i, ii, iii, iv and v.

A sub-minimum of 50 per cent is required for Subdivisions vi and vii.

Requirements for participation for the award "with soloistic distinction"

- (a) At least six works must be played by heart in their entirety and must be chosen as follows:

- At least one from Group B - 2
- At least one from Group C - 3
- At least one from Group D - 4
- At least two from Group E - 5

- (b) The average percentage required in Groups ii, iii, iv and v is 68.
- (c) A programme of at least one hour must be performed by heart in public.
- (d) One piano concerto, with orchestral accompaniment, ensemble or second piano must (if conducted) be performed by heart in public.

#### Training centre

Conservatoire for Music, Pretoria.

Vocational service: The courses of the Conservatoire which have been briefly discussed here have been accepted and evaluated by the Committee of Heads of Education. Depending on the diploma which a candidate obtains in accordance with his/her special preference, it is possible to be appointed to a post as lecturer at a university or college for advanced technical education. Others become music teachers at secondary school or school music centres, while some teach music privately. Some enter the service of the Performing Arts Councils or other organizations with professional orchestras. Exceptionally able candidates, of whom a number of examples can be named, may appear as soloists in this country or pursue an exciting career abroad.

Merit bursaries are available to exceptionally talented students, and loan bursaries are offered by the Gradus ad Parnassum Society, while various city councils and large business undertakings award bursaries from time to time.

### C. SUPPLEMENTARY HEALTH SERVICES AND RELATED FIELDS

#### 1. AUDIOMETRICIANS (NEURO-OTOLOGICAL TECHNICIANS)

CERTIFICATE OF THE DEPARTMENT OF OTOLARYNGOLOGY, GROOTE SCHUUR HOSPITAL

Admission qualification: A Standard X Certificate. Preference will be given to candidates who have passed in Mathematics and a science subject.

Nature and duration of the course: The course extends over two years.

#### Subjects

Anatomy and Physiology of Speech and Hearing  
 Elementary Physics  
 Elementary Psychology  
 Theory and Practice of Audiometry  
 Other Neurological Tests  
 Clinical Otology  
 Practical Work

#### Training centre

Groote Schuur Hospital, Cape Town.

Vocational service: This course equips candidates, among other things, to determine the degree of hearing dysfunction in patients with the aid of special apparatus. Audiometricians are consequently mainly employed by hospitals and hearing clinics.

#### 2. BEAUTY CULTURE

NATIONAL CERTIFICATE IN BEAUTY CULTURE

Admission qualification: The admission qualification set out on p.74 also applies to this course.

Nature and duration of the course: The course extends over one year and is offered on a full-time basis.

## Subjects

Beauty Culture (Theory)  
Beauty Culture (Practical Work)  
Physiology, Anatomy and Hygiene  
Beauty Culture Science (Cosmetology)  
Business Practice  
Art for Beauty Culture

## Non-examination subjects

Speech and Deportment  
Physical Recreation

## Training centres

Colleges for Advanced Technical Education.

Vocational service: The beauty specialist of today is no longer merely a person who cares for the skin and the nails and gives advice on make-up and its use. Her activities cover a much wider field, since beauty therapy does not end with the face and the skin. The use of modern massage and other apparatus, well-equipped salons in which the work is done, close co-operation with medical practitioners, dermatologists, dieticians and sometimes psychiatrists are reasons why this occupation today is diversified, interesting, satisfactory and remunerative.

Beauty treatments are becoming more and more popular as more persons realize their value. For this reason, the demand for beauty salons with well-trained persons is continually increasing. Although it may vary from person to person and may also depend on the success attained by a private undertaking, a qualified person who also maintains a high standard of service can achieve great success in this career.

In factories manufacturing cosmetics, they are employed as representatives, while in beauty salons they render services as beauty therapists.

### 3. BLOOD TRANSFUSION TECHNICIANS

Admission qualification: A Standard X Certificate.

Nature and duration of the course: The course extends over two years and includes theoretical as well as practical training. No candidate may write the examination until he/she has worked for at least 24 months in a blood transfusion laboratory.

#### Theoretical training

The following theoretical training takes place during the 24 months:

Correct use of laboratory glassware and equipment	Theoretical aspects of the practical work:
Elementary Haematology	Ante-natal Investigations
Blood Donation	Post-natal Investigations
Elementary Immunology	Donor Grouping and Blood Banking
Principles of Blood Grouping	Crossmatching
Elementary Genetics	Transfusion Reactions
The Blood Groups	Preparation of Blood Components

#### Practical training

Adequate practical training in the following categories:

Ante-natal Serology	Crossmatching
Post-natal Serology	Investigation of Transfusion Reactions
Donor Grouping and Blood Banking	Preparation of Blood Components

#### Training centres:

See laboratories marked with an asterisk in the list of approved categories and laboratories for the training of Medical Laboratory Technologists, p. 130.

Vocational service: These technicians are employed by hospitals, clinics, laboratories and other institutions where blood transfusion services are rendered.

#### 4. CHIROPODY

##### NATIONAL DIPLOMA IN CHIROPODY

Admission qualifications: At least a Standard X Certificate approved by the Department of National Education with a pass in Biology, Physiology or Physical Science. A pass in Mathematics is desirable.

Nature and duration of the course: The course extends over three years of full-time college attendance and one year in-service training in a hospital or foot clinic approved by the SA Medical and Dental Council.

##### First year

Health Science  
Human Physiology T  
Microbiology T1 (Theory)  
Microbiology T1 (Practical)  
General Anatomy and Histology  
Psychology

##### Second year

Regional Anatomy  
Chiropathology  
Podology  
Appliances I (Practical)  
Chiropody I (Practical)  
Therapeutics I

##### Third year

Surgery  
Appliances II  
Chiropody II (Practical/oral)  
Therapeutics II  
Podology II  
Practice, Management and Ethics

##### Note

- (i) Exemptions from one or more subjects in any year may be granted by the Department on the recommendation of the SA Medical and Dental Council.
- (ii) A valid certificate in First Aid and Home Nursing must be submitted before the diploma will be issued.

##### Training centres

Colleges for Advanced Technical Education.

Vocational service: Foot problems are common among people and such persons are dependent on the help of experts. Chiropodists are therefore an important part of the medical team responsible for the diagnosis and treatment of this physical problem. Their services are in great demand in hospitals and foot clinics as well as in concerns manufacturing or selling shoes.

#### 5. COMMUNITY HEALTH NURSING

##### NATIONAL DIPLOMA IN COMMUNITY HEALTH NURSING

Admission qualification: Registration as a general nurse and as a midwife or as a general nurse (male).

Nature and duration of the course: The course is a full-time course extending over one academic year, i.e. two semesters.

Every student must attend a course of lectures, demonstrations and visits of observation and undergo the prescribed practical training of, inter alia, a minimum of 25 visits of observation and demonstrations, and practical work for 60 full working days.

##### Subjects

Administration and Public Health  
Principles and Practice of Public Health Nursing

## Subjects (continued)

Family Health  
Social Sciences  
Project

## Training centres

Colleges for Advanced Technical Education.

Vocational service: The community health nurse is, in the first place, a qualified and capable general and maternity nurse with experience and is concerned with promoting the health of the family. If she has the necessary qualities of character and personality, a good domestic and educational background and is interested in the general health and welfare of the people in her society she can, on attainment of this diploma, enter the service of government or local health department or industrial undertaking as a health visitor or district nurse, or she can become a school nurse in the employ of an education department.

The community health nurse must thus be an intelligent, versatile and thoroughly trained lady with a knowledge of human nature and a sympathetic approach, since she must also be a capable and friendly adviser to many people. A keen sense of humour will contribute largely towards making her work pleasant and satisfying. The health visitor/school nurse renders an extremely valuable national service by supplying guidance to the community and tracing and eliminating conditions which can be injurious to physical and mental health. The occupation offers a challenge to the person who has a love for others and likes to perform constructive work.

## 6. DENTAL ASSISTANTS

DIPLOMA FOR DENTAL ASSISTANTS

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over one year of full-time study.

### Subjects

Human Relations  
Dental Radiography I, II  
Dental Science  
Dental Equipment and Instrumentation  
Clinical Orientation I, II  
Dental Materials I, II  
Microbiology  
Anatomy and Physiology  
Personal Hygiene  
Typing and Office Machines  
Dental Office Management  
Dental Ethics and Professional Relations  
Clinical Practicum

Successful candidates also qualify for First Aid and Office Machine Certificates.

### Training centres

Colleges for Advanced Technical Education.

Vocational service: The busy dentist usually requires the assistance of one or more dental assistants to help him in the execution of his task and to facilitate the work. The dental assistant is an important member of the dental health team. She must, for instance, receive the patients, set them at ease and prepare them for examination, treatment or an operation. She takes care of the necessary instruments, prepares the dental material and assists the dentist. In addition to other duties such as the development of X-ray photographs and even the provision of dental guidance, she must carry out most of or all the routine tasks in the consulting rooms.

This field offers an ideal opportunity for intelligent young women with a pleasant personality and the gift to make people feel at home. The comprehensive course is of only one year's duration and although the later practical experience contributes towards the training, the students are adequately equipped for their task. All dentists in private and group practices employ assistants. Posts are also available at clinics or hospitals.

Further information on the training and vocational service of dental assistants is obtainable from The Dental Association of SA, Private Bag X1, Houghton 2041.

## 7. DENTAL TECHNOLOGY

### DIPLOMA IN DENTAL TECHNOLOGY

Admission qualifications: A Standard X or equivalent certificate with at least one science subject.

Within 30 days of the commencement of the course a student must pass an aptitude test set by the institution and if he fails in this test he is not allowed to continue with the course.

Nature and duration of the course: The course extends over 2½ years' full-time study at an approved institution, followed by one year of further practical training in an approved dental laboratory.

#### First year

Dental Laboratory Technique I (Theory and Practical)  
Dental Materials and Metallurgy I  
Chemistry  
Physics  
Biological Sciences

#### Second year

Dental Laboratory Technique II (Theory and Practical)  
Dental Materials and Metallurgy II  
Business Administration  
Jurisprudence

#### Third year (six months)

Dental Laboratory Technique III (Theory and Practical)  
Dental Materials and Metallurgy III

At the end of the one year of further practical training in a dental laboratory a practical examination is conducted in Dental Mechanics by the Dental Mechanics Board, which will then issue the Diploma.

Upon successful completion of the 2½-year study course the Board will issue a Certificate in Dental Technology.

#### Training centres

Pretoria College for Advanced Technical Education. (Attention is being given to extending the training to other institutions.)

Vocational service: A dental mechanic must display a keen interest in his work. He must be thoroughly trained and be an expert in his field, since the work is extremely delicate and his product can sometimes affect the patient's appearance and health. The work involves, for example, the manufacture of artificial teeth as well as dentures of gold and steel. Gold fillings are also cast and completed dentures, bridge and crown work repaired or altered. The manufacture of orthodontic apparatus is an interesting aspect of the work.

A dental mechanic is usually employed by a dentist or another mechanic who works as a contractor. He can also procure his own laboratory and work as a contractor for various dentists. However, all work must be performed at the request of dentists and the dental mechanic may not serve the public directly.

Training of dental mechanics is controlled by the Dental Mechanics Board and this ensures that the occupation is not practised by poorly trained or untrained persons. Registration with the Board is compulsory and South African qualifications are also recognized in other countries. The address of the Board is P.O. Box 995, Pretoria 0001.

## 8. ELECTROENCEPHALOGRAPHIC (EEG) TECHNICIANS

Admission qualification: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). Formal nursing qualifications are desirable.

Nature and duration of the course: The theoretical course consists of 24 hours of lectures/demonstrations spread over 2 weeks. The practical course comprises on-the-job experience in the recording of EEGs for 12 months under the supervision of a medical specialist (e.g. neurologist and psychiatrist) trained in electroencephalography, or an electroencephalographer.

A diploma or certificate is not awarded. Candidates are prepared for examinations in the theory and practice of EEG technology. If the candidate passes these, he/she may apply for registration as EEG technician with the South African Medical and Dental Council.

### Theoretical training

Introduction to anatomy, physics and chemistry, physiology in brain function and electronics

History of electroencephalography

Neuropathology, neurophysiology, neurology and neurosurgery

Recording techniques, advanced EEG techniques and practical machine maintenance

The EEG in psychology and psychiatry

The normal and abnormal EEG

The EEG and epilepsy

The EEG in sleep

Electrophysiology

### Training centre

Division of Neuropsychology, National Institute for Personnel Research, CSIR, Johannesburg.

Vocational service: The recording of Electroencephalograms (EEGs), showing the electrical activity of the brain, is specialised and complex. These charts (tables) are recorded in hospitals, private clinics and in laboratories of research organizations, as aids in the diagnosis of such conditions as epilepsy and brain damage. In order to be able to record EEGs which are technically of a high standard, the EEG technician must be well grounded in the theory of the procedure and have at least one year's practical experience.

Further information on training and career aspects can be obtained from the NIPR or from the President, South African EEG Society, P.O. Box 10319, Johannesburg 2000.

## 9. HEALTH EDUCATION

### NATIONAL CERTIFICATE IN HEALTH EDUCATION

Admission qualifications: Registration as a general nurse with the South African Nursing Council or a qualification for Health Visitors recognized by the State Health Department or any other qualification with similar basic training in the public health field and which the Department of National Education considers suitable for purposes of this course, plus a minimum of two years' post-qualification experience in the health field.

Nature and duration of the course: The course extends over one academic year of not less than 200 lecture hours, full-time or part-time.

#### Part I

Study of the community, comprising the following:

Sociological Background

Man in particular situations which necessitate Health Education

#### Part II

Principles of Learning and Teaching:

Lectures

Practical

Part III

Methods of studying disease patterns in the community and their application to solving health problems:  
Statistical Method  
Epidemiological Method

Part IV

Practical Work

Training centres

Colleges for Advanced Technical Education.

Vocational service: This course was established with a view to extending the training of persons who are already qualified in public health, so that they can also provide health guidance. The field of employment entails an intense interest in one's fellow man; in his physical, social and spiritual development, as well as in the problems by which he is threatened in this age of change and conflict. The health educator must thus be prepared to accept part of the responsibility of solving health problems by helping the sick and protecting the healthy.

This branch of public health services is still in its initial stage but is receiving growing recognition. At present there are job opportunities in the divisions of health which are controlled by government departments, in large municipalities or with private concerns. Since candidates who wish to take the course must already have had practical experience, they are in the position to determine for themselves where the best opportunities lie.

10. HEALTH OFFICERS ( HEALTH INSPECTORS)

NATIONAL DIPLOMA IN PUBLIC HEALTH

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years of full-time or part-time study. It consists of attendance at lectures, practical training and practical work assignments. Students undergo practical training at approved health departments. In the case of practical training in Meat Hygiene, a candidate must complete a total of at least 200 hours' meat inspection at an approved abattoir.

First year

Building Practice  
Sanitary Science  
Health Science  
Microbiology  
Human Physiology T

Second year

Housing and Housing Management  
Industrial Hygiene  
Environmental Hygiene  
Food Hygiene  
Epidemiology

Third year

Social Psychology  
Health Administration  
Health Education  
Meat Hygiene

Training centres

Colleges for Advanced Technical Education.

Vocational service: The duties of a health officer are of an extremely divergent nature. They embrace man in his entirety, his environment, his food and water supply, accommodation, recreation, cleansing services, prevention of diseases, etc. The work is basically determined by laws, regulations and ordinances. Although the results of the health officer's work cannot always be expressed in terms of money, he renders a service of inestimable value. It is an occupation in which men in particular are interested but it also offers ample opportunities to women, since employment circumstances can be of such a varying nature.



The demand for trained health officers is constantly increasing and there is a considerable shortage at present.

They are employed, for example, by the government departments of Health, Agricultural Technical Services and the SA Defence Force; the four provincial administrations and the Administration of South-West Africa, municipalities, the railways, the mines, Iscor, the SABS and food factories and shops.

Qualified health officers can also further their studies and, for example, obtain the National Diploma in Tropical Hygiene or the National Diploma in Pollution Control.

## 11. HOUSING MANAGEMENT

### NATIONAL CERTIFICATE IN HOUSING MANAGEMENT

Admission qualifications: A Standard X Certificate or any other certificate recognized by the Department of National Education as equivalent thereto.

Persons not having a Standard X Certificate but who hold qualifications approved by the Department for which a Standard X Certificate was not previously a requirement but for which a Standard X Certificate is at present a minimum requirement, will on application to the Department be considered for admission.

Persons of not less than 35 years of age not having a Standard X Certificate or qualifications mentioned in the previous paragraph, but who have had appropriate experience in housing management for a period of at least five years in an approved centre, will on application to the Department be considered for admission. In this case certificates will, however, not be issued before such persons have passed the two official languages at Standard X level, at least one on the higher grade.

A candidate who has passed in at least five subjects for the Standard X Certificate or has obtained an equivalent qualification, and who is at least 23 years of age, may be granted conditional admission to the course, subject to such conditions as the Secretary for National Education may determine.

Nature and duration of the course: The National Certificate in Housing Management will be awarded to a candidate who has passed the written examination in all subjects and who can produce a certificate signed by the head of the centre (see Practical training) to the effect that such candidate has satisfactorily completed twelve months' practical training, provided that the combined period of study and practical training shall be of a duration of not less than two years.

Practical training undertaken before the course of study will be recognized.

#### Theoretical subjects

Law and Finance

Planning and Lay-out of Housing Schemes and Design of Dwellings

Building Construction, Maintenance and Basic Hygiene

Administration and General Tenant Welfare

Practical training of not less than twelve months' duration in a centre administered by a qualified Housing Manager or other suitably qualified person who deals with all aspects of housing and controls a minimum of 300 dwellings.

#### Training centre

Witwatersrand College for Advanced Technical Education (External Studies).

Vocational service: The general welfare of workers, which includes the aspect of suitable housing, is one of the factors which should be considered in any reflection on productivity in general. An increasing number of bodies are realizing the implications of this problem and they consequently attempt, by means of a scheme of some kind, to satisfy the housing requirements of workers.

The general administration of such schemes requires the services of trained persons to fill posts in managerial, administrative and supervisory capacities. Among the bodies which employ such persons are, for example, the Government departments of Community Development, Bantu Administration and Development and Coloured, Rehoboth and Nama Relations; large undertakings such as Iscor, the SAR and H, the

mining companies, etc. There are also private companies such as the Citizens' Housing League which make cheap housing available.

## 12. INSTITUTIONAL CARE FOR THE AGED

NATIONAL CERTIFICATE (INSTITUTIONAL CARE FOR THE AGED)

Admission qualification: This is an open course for Whites.

Nature and duration of the course: It is a two-year course which is offered through correspondence by the Witwatersrand College for Advanced Technical Education.

### First year

Care of the aged  
Administration and Control  
Physical and Health Care  
Utilization of leisure

### Second year

Psychological Care  
Spiritual Care  
Personnel Administration  
Internal Institutional Management

### Practical work

An unbroken period of one month's work is performed in the first year of study and a further month in the second year of study. The Department of Social Welfare and Pensions determines the centres where practical work can be done and the College will supply this information. The Department of Social Welfare and Pensions will also issue a certificate to indicate that practical work has been satisfactorily performed.

Vocational service: At present there are a considerable number of homes for the aged and psychiatric hospitals throughout the country which urgently require the services of trained persons. More than 35 of these institutions are prepared to accept students for their practical work during their term of study.

The opportunity for training is available for young ladies but those not so young any more should also consider a career in this field. The duties which have to be performed border on those of an ordinary nurse and persons with the interest and aptitude for caring for their fellow men should derive enjoyment and satisfaction from this career.

## 13. MEDICAL LABORATORY TECHNOLOGY

NATIONAL INTERMEDIATE CERTIFICATE and

NATIONAL DIPLOMA IN MEDICAL LABORATORY TECHNOLOGY

Admission qualification: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) or a certificate approved by the SA Medical and Dental Council.

Nature and duration of the course: Two examinations have to be written.

(i) The Intermediate (Certificate) examination, which includes the following subjects:

Physics  
Chemistry  
Anatomy and Physiology  
General Laboratory Technique

The first three subjects mentioned may be written at any time. The subject General Laboratory Technique may be written after 6 months' practical training at an approved registered laboratory. One year's full-time training at an approved college is recognized as equivalent to 6 months' practical training at an approved registered laboratory. Attendance of classes for the intermediate examinations is not essential, but tuition is offered at colleges for advanced technical education either part-time or full-time. Part-time training lasts two years and full-time one year.

(ii) The Final (Diploma) examination is taken in one of the following categories:

A Blood Transfusion Technology	I Histopathological Technique
B Cardiology	J <u>Lung Function:</u>
C Chemical Pathology	Pulmonary Function Techniques
D Clinical Pathology (comprising Microbiology, Chemical Pathology and Haematology)	Cardiopulmonary Anatomy and Physiology Cardiopulmonary Pathology
E Cytogenetics	K Microbiology
F Cytotechnology	L Parasitology
G Forensic Pathology	M Pharmacology
H Haematology	N Virology

Only candidates who have had at least two-and-a-half years' training, two of which must have been in approved laboratories of the specific category in which they intend writing examinations, may be admitted to the examinations for the final categories.

Candidates who have already passed in a final category and wish to write a second one must have at least 2 years' experience in an approved laboratory of the second category.

Clinical Pathology: Before candidates may write the examination in Clinical Pathology they must have completed at least four months' training in each section.

Statements to the effect that the required training for each category has been done must be submitted when entering for examinations.

Lung Function: A candidate may be allowed to proceed to the final examination provided he/she has passed in at least 3 subjects of the Intermediate Examination. Only one subject may be carried forward and it must be passed in the following year.

#### Training centres

Colleges for Advanced Technical Education  
Some Technical Colleges.

#### Laboratories approved for the training of Medical Laboratory Technologists

Note: (i) Categories approved are given in brackets

(ii) The \* indicates training centres for Blood Transfusion technicians.

(iii) More laboratories and categories are being approved from time to time.

#### CAPE PROVINCE

The Director  
\*SA Institute for Medical Research  
PORT ELIZABETH  
6001 (A,C,D,F,H,I,K,L,N)

Drs R. Fry and A.M. Linder  
P.O. Box 38  
BELLVILLE  
7530 (F)

Senior Pathologist  
Pathology Laboratory  
Frere Hospital  
Private Bag 9018  
EAST LONDON  
5200 (C,D,F,H,I,K)

\*The Director  
Western Province Blood Transfusion  
Service  
P.O. Box 3788  
CAPE TOWN  
8000 (A)

Dr B.C. Ellis  
2 Kerrera  
Pearson Street  
PORT ELIZABETH  
6001 (C,D)

\*The Director  
The Border Blood Transfusion Service  
P.O. Box 752  
EAST LONDON  
5200 (A)

The Head  
Dept of Pathology  
Medical School  
University of Cape Town  
OBSERVATORY  
7900 (C,D,H,I,K,N)

Director of Health Laboratory  
Services  
State Pathology Laboratories  
Private Bag X9066  
CAPE TOWN  
8000

Cape Town: (C,D,G,H,I,K)

East London: (C,D,H,K)

George: (C,D,H,K)

State Vaccine Institute: (N)

Upington: (C,D,H,K)

Worcester: (C,D,H,K)

Drs W.G. Davis, N. Beyers  
and T.P.A. Mulligan  
720 Medical Centre  
Heerengracht  
CAPE TOWN  
8001 (C,D,H,I,K)

The Medical Superintendent  
Conradie Hospital  
P.O. Howard Place  
PINELANDS  
7405 (D)

Dr J.I. Perold  
P.O. Box 161  
EAST LONDON  
5200 (D)

The Head  
Dept of Obstetrics and  
Gynaecology  
Medical School  
University of Cape Town  
OBSERVATORY  
7900 (F)

The Head  
Pathology Laboratory  
Umtata Hospital  
Private Bag X980  
UMTATA  
5100 (C,D,H,K,L)

Drs V. Wolfe and N.J. van der  
Westhuizen  
44 Tygerberg Medical Centre  
Voortrekker Road  
BELLVILLE  
7530 (D)

The Head  
Cardiac Clinic Catheterisation  
Laboratory  
Groote Schuur Hospital  
OBSERVATORY  
7900 (B)

The Head  
Department of Pathology  
Faculty of Medicine  
University of Stellenbosch  
Tygerberg Hospital  
P.O. Box 63  
TIERVLEI  
7503 (C,D,H,I,K,L,N)

The Head  
Department of Obstetrics and  
Gynaecology  
Faculty of Medicine  
University of Stellenbosch  
Tygerberg Hospital  
P.O. Box 63  
TIERVLEI  
7503 (F)

\*The Director  
Provincial Blood Grouping Laboratory  
Private Bag X4  
OBSERVATORY  
7935 (A)

Dr W. Clegg  
922 Medical Centre  
Foreshore  
CAPE TOWN  
8001 (D)

Drs Schapera, Slobedman and Merkel  
524 Medical Centre  
CAPE TOWN  
8001 (D)

Dr B.P. Mather  
P.O. Box 740  
KIMBERLEY  
8300 (D)

\*The Medical Director  
Eastern Province Blood Transfusion  
Service  
P.O. Box 1567  
PORT ELIZABETH  
6000 (A)

Dr W.J. Naudé  
25 St Lukes Road  
EAST LONDON  
5201 (D,H,K)

The Head  
Lung Function Laboratory  
8th Floor  
Tygerberg Hospital  
TIERVLEI  
7503 (J)

Chief Pathologist  
Red Cross War Memorial  
Children's Hospital  
Klipfontein Road  
RONDEBOSCH  
7700 (C,D,H,I,K)

The Head  
Cardiac Unit  
Tygerberg Hospital  
Private Bag  
TIERVLEI  
7500 (B)

#### NATAL

Drs Drummond, Taylor, Rifkin,  
Swanepoel, Roach and Ferguson  
416 Salisbury House  
West Street  
DURBAN  
4001 (C,D,F,H,K)

\*The Director  
Natal Blood Transfusion Service  
& Rhesus Laboratory  
P.O. Box 2356  
DURBAN  
4000 (A)

Drs A.L. Rencken & E.E. Naude  
4 Medical Centre  
331 Burger Street  
PIETERMARITZBURG  
3201 (D)

The Head  
State Pathology Laboratory  
P.O. Box 1015  
DURBAN  
4000 (C,D,F,G,I,K,L)

The Head  
Thoracic Unit  
Department of Surgery  
Wentworth Hospital  
Private Bag  
JACOBS  
4026 (B)

#### ORANGE FREE STATE

Drs Voight, Price and Agenbag  
527 Trustfontein Building  
151 St Andrew Street  
BLOEMFONTEIN  
9301 (C)

The Head  
Cardiac Laboratory  
Dept of Cardiac Surgery  
University of Cape Town  
Medical School  
OBSERVATORY  
7900 (B)

The Head  
Cardio-Thoracic Surgery Laboratory  
Karl Bremer/Tygerberg Hospital  
P.O. Box 63  
TIERVLEI  
7503 (B)

The Chief Pathologist  
Natal Provincial Administration  
Private Bag X4331  
DURBAN  
4000

(i) Central Pathology Laboratory  
Durban (incorporating Labora=  
tories of Clairwood Hospital,  
RK Khan Hospital and Wentworth  
Hospital) (C,D,F,H,I,K)

(ii) King Edward VIII Hospital  
(including Medicine  
School) (C,D,H,I,K,L)

(iii) Grey's Hospital (D)

The Head  
The State Pathology Laboratory  
Edendale Hospital  
PIETERMARITZBURG  
3201 (C,D,F,H,I,K)

The Head  
Department of Pathology  
University of the Orange Free State  
P.O. Box 339  
BLOEMFONTEIN  
9300 (C,D,H,I,K)

The Head  
Department of Anatomical Pathology  
University of the Orange Free State  
P.O. Box 339  
BLOEMFONTEIN  
9300 (F)

The Head  
Respiratory Section  
National and Pelonomi Hospital  
Private Bag X0598  
BLOEMFONTEIN  
9300 (J)

\*The Director  
The SA Institute for Medical Research  
P.O. Box 1038  
JOHANNESBURG  
2000 Welkom Hospital (A,C,D,F,H,I,K,L,N)

TRANSVAAL

Drs W.J. Pepler and H.P. van Tonder  
P.O. Box 11112  
Lynnwood  
PRETORIA  
0081 (I,F)

Drs Sims, Bloomberg, Lewin, Holman,  
Brunt, Aaron and Zail  
1206 Medical Centre  
Jeppe Street  
JOHANNESBURG  
2001 (D,C,F,H,I,K)

Drs L.J.C. van Tonder, J.L. Meiring  
and J.H. Enslin  
710 Robert Koch Building  
Pretorius Street  
PRETORIA  
0002 (C,D,H,I,K)

Drs Van Drimmelen and Partners  
P.O. Box 62336  
MARSHALLTOWN  
2107 (C,D,F,H,I,K)

Dr H.I. Blumberg  
P.O. Box 872  
GERMISTON  
1400 (C,D,H,K)

The Institute for Pathology  
University of Pretoria  
Brooklyn  
PRETORIA  
0181 (C,D,F,H,I,K,N)

The Director  
\*The SA Institute for Medical  
Research  
P.O. Box 1038  
JOHANNESBURG  
2000

The Medical Director  
\*The SA Blood Transfusion Service  
P.O. Box 9326  
JOHANNESBURG  
2000 (A)

Branch Laboratories

Central Pathology Laboratory,  
Johannesburg  
Boksburg-Benoni Hospital  
Natalspruit  
Pietersburg  
Port Elizabeth  
Vereeniging  
Welkom  
Windhoek

The Director  
Histology Laboratory  
Oral and Dental Hospital  
University of the Witwatersrand  
Jan Smuts Avenue  
JOHANNESBURG  
2001 (I)

Drs Gluckman, Isaacson and Abrahams  
P.O. Box 1178  
JOHANNESBURG  
2000 (F,I)

Note: The categories  
A,C,D,F,H,I,K,L,N are  
approved for each of these  
branch laboratories.

The Regional Director  
Siegfried Anneck Institute  
P.O. TZANEEN  
0850 (L)

Drs Irving, Schrire, Zent, Gon,  
Mauff and Bradlow  
P.O. Box 8475  
JOHANNESBURG  
2000 (C,D,H,K)

Drs C.H. Coetzee, T.H. de Villiers and  
E.E. de Beer  
P.O. Box 523  
KLERKSDORP (I,D,F)

Dr. P.M. Soldin  
P.O. Box 1429  
VEREENIGING  
1930 (C,D,H,K)  
The Superintendent  
Ga-Rankuwa Hospital  
Private Bag X422  
PRETORIA  
0001 (D,F,H,K)  
The Director  
Dental Research Unit  
University of the Witwatersrand  
Milner Park  
JOHANNESBURG  
2001 (I)  
The Head  
Dept of Cardio-Thoracic Surgery  
University of the Witwatersrand  
Medical School  
Hospital Street  
JOHANNESBURG  
2001 (B)

Dr. J. du Buisson  
43 Van Riebeeck Medical Buildings  
Schoeman Street  
PRETORIA  
0002 (C,D,H,K)  
The Head  
Dept of Pathology and Microbiology  
University of the Witwatersrand  
Milner Park  
JOHANNESBURG  
2001 (C,D,H,I,L)  
The Head  
Johannesburg General Hospital  
Cardiac Clinic  
Department of Medicine  
JOHANNESBURG  
2001 (B)  
The Head  
Respiratory Unit  
Johannesburg Hospital  
Lung Function Laboratory  
JOHANNESBURG  
2001 (J)

#### Note

For a few categories no approved laboratories are indicated. Laboratories are, however, being approved from time to time and enquiries in this connection must be directed to: The Society of Medical Laboratory Technologists of S.A. or the S.A. Medical and Dental Council.

Vocational service: Persons who qualified in one or more of the above-mentioned categories may register as medical technologists with the SA Medical and Dental Council.

The phenomenal development in the field of medicine offers a stirring challenge to the medical technologist. Modern apparatus and techniques are being used to an increasing extent for the rapid and accurate diagnosis of diseases. In this way, the medical technologist stands side by side with the doctor in the service of his fellow man in the fight against disease.

A person who wishes to become a medical technologist is usually employed by an approved laboratory where he undergoes practical training while attending part-time classes at a college for advanced technical education or a technical college. In the laboratory he becomes acquainted with the activities which can be divided into three main groups, viz analysis in order to diagnose diseases, research work and the preparation of serums and vaccine. These three functions are not necessarily performed in all laboratories. Clinical Pathology is usually divided into haematology, chemical pathology, pathological anatomy and microbiology.

Medical technologists are employed by government and provincial hospital laboratories, the South African Institute for Medical Research with branches practically throughout the country and which functions in conjunction with the South African Medical Research Council and various universities, pathological institutes of universities and private pathologists. There is a great demand for qualified medical technologists and men as well as women can pursue the occupation. They need not necessarily work in a medical laboratory after completing their training but can, for instance, be employed at Onderstepoort or other veterinary laboratories, where the work is basically the same. Industrial concerns, for example the pharmaceutical companies, are making increasing use of medical technologists.

Further information on the training of Medical Technologists may be obtained from the Executive Secretary, The Society of Medical Laboratory Technologists of S.A., P.O. Box 1038, Johannesburg 2000.

#### 14. MEDICAL REPRESENTATIVES

NATIONAL CERTIFICATE FOR MEDICAL REPRESENTATIVES

Admission qualification: A Standard X Certificate or equivalent certificate with

Physical Science or Chemistry as a subject. Persons who do not comply with the admission qualifications, but who have reached the age of 23 years and have appropriate approved experience, may apply through the training institution to the Department of National Education for admission to the course. Certificates will not be issued to students who have not passed in the two official languages, one on the Higher Grade and the other on the ordinary or Higher Grade at Standard X level.

Persons who have not passed in Physical Science or Chemistry at Standard X level must complete an approved introductory course in Physical Science.

Nature and duration of the course: Until a part-time or even a sandwich course is justified, instruction will be given by means of a correspondence course through the Witwatersrand College for Advanced Technical Education. The course extends over a period of two years.

First year

Introductory Science  
Biology T  
Pathology I  
Afrikaans A or English A

Second year

Pathology II  
Chemotherapy  
Pharmacology  
English A or B OR Afrikaans A or B  
(provided it is not the language taken during the first year)

The Department of National Education will issue a certificate only if, in addition to having passed the examinations, the candidate has supplied documentary proof to the Department, through the training institution where he trained, that he has had a minimum of three years' approved appropriate experience of which at least two years must have been appropriate experience in the medical or pharmaceutical field.

Note: "Approved" means approved by the Department of National Education in consultation with the Pharmaceutical and Chemical Manufacturers' Association of South Africa Limited.

Training centre

Witwatersrand College for Advanced Technical Education, Johannesburg.

Vocational service: Pharmaceutical companies can publicise manufactured medicines by means of medical representatives or, for example, by brochures, advertisements in professional periodicals and by making samples available. However, the publicising of products by means of personal liaison still remains the most effective method and the medical representative fulfils an extremely important function, particularly in the medical field. His task does not end with liaison and sales work. In fact, he constitutes an important channel through which, for example, doctors, hospitals, clinics and pharmacists can exchange ideas with manufacturers of medical products. The medical representative must consequently be extremely well acquainted with preparations which are marketed and also with the requirements and the latest developments in medical science - truly a very interesting, satisfying and rewarding career for the right man or woman.

Persons who are interested in this occupation must enter the service of an approved laboratory, factory, company or related undertaking, since proof of one year's such service is required before the course can be commenced.

15. NURSING

GENERAL INFORMATION

Training: The training of nurses in the RSA and South-West Africa is controlled by the South African Nursing Council, the statutory body which lays down the requirements for the training and examinations. Training and examining are conducted in the official language of the candidate's choice. Lectures, demonstrations, etc. are given at fixed times in modern and well-equipped nursing colleges, while practical clinical training is received in the wards and sections of training hospitals. On completion of the course, the student is registered with the SA Nursing Council as a professional nurse in one of the fields. The Council then issues the Diploma of the SA Nursing Council.

Degree courses in Nursing are offered by most universities, in co-operation with training hospitals, For this purpose, candidates must be in possession of a



Matriculation Exemption Certificate and must also furnish proof of registration as students with the SA Nursing Council.

The University of the Orange Free State also offers a four-year diploma course in Nursing. The admission requirement for this course is a Standard X Certificate. Some of the universities also offer the post-basic fields of specialization for nurses.

Full particulars on the training of nurses at universities can be obtained from the universities. The addresses appear on p.220.

Post-basic specialization: Registered nurses who wish to specialize have a choice, for example, of one of the following basic courses: Operating Theatre Technique, Orthopaedic Nursing, Pediatric Nursing, Public Health Nursing, Intensive Nursing Care, Ward Administration and Clinical Teaching, District Nursing, Ophthalmic Nursing, Nursing Administration, Nursing Education.

Enrolled nurses: Pupils who are in possession of a Standard VIII certificate are trained as enrolled nurses. The training extends over a period of two years. On successful completion of the final examination, they are enrolled with the SA Nursing Council.

Regulations: It is definitely in the best interests of the candidates that they should acquaint themselves with the regulations of the SA Nursing Council with regard to the following, for example: Exemptions from parts of courses, promotions (minimum required number of subjects which candidates should pass to progress from year to year), requirements for admission to examinations, etc.

Course structure: In the courses which follow, only the main fields of study are given, although each of them has a number of subdivisions. It must also be mentioned that clinical training, including practicals, in the wards and sections of the training hospitals, forms part of each course.

#### (i) GENERAL NURSE

##### DIPLOMA FOR REGISTRATION AS A GENERAL NURSE

Admission qualifications: A candidate must submit a Standard X Certificate or equivalent certificate; or proof of current registration as a nurse or as a midwife, or proof of current enrolment as a nurse or as a nurse (male).

Nature and duration of the course: The course extends over three years.

##### First year

General Nursing Science and Art I and  
Clinical Practica I  
Ethos of Nursing  
Introduction to Microbiology,  
Parasitology and Pharmacology  
Anatomy and Applied Medical Biophysics

##### Second year

General Nursing Science and Art II and  
Clinical Practica II  
Physiology and Applied Chemistry  
Microbiology, Parasitology, Pathology  
and Pharmacology

##### Third year

General Nursing Science and Art III  
and Clinical Practica III  
Introductory Midwifery  
Social Sciences, Social Care and Mental  
Health Care  
Preventive and Promotive Health Care and  
Family Planning and Practica

#### (ii) GENERAL NURSE AND MIDWIFE

##### DIPLOMA FOR REGISTRATION AS A GENERAL NURSE AND MIDWIFE

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The duration of the course is three years and six months.

First year

General Nursing Science and Art I and  
Clinical Practica I  
Ethos of Nursing  
Introduction to Microbiology,  
Parasitology and Pharmacology  
Anatomy and Applied Medical Biophysics

Third year

General Nursing Science and Art III and  
Clinical Practica III  
Science and Art of Midwifery  
Social Sciences, Social Care and  
Mental Health Care  
Preventive and Promotive Health Care  
and Family Planning and Practica

Second year

General Nursing Science and Art II and  
Clinical Practica II  
Physiology and Applied Chemistry  
Microbiology, Parasitology, Pathology  
and Pharmacology

Final semester

Science and Art of Midwifery, Neo-natal  
Care and Mothercraft (from infancy  
to the pre-school child)

(iii) GENERAL NURSE AND PSYCHIATRIC NURSE

DIPLOMA FOR REGISTRATION AS A GENERAL NURSE AND PSYCHIATRIC NURSE

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The duration of the course is three years and six months.

First year

General Nursing Science and Art I and  
Clinical Practica I  
Ethos of Nursing  
Introduction to Microbiology,  
Parasitology and Pharmacology  
Anatomy and Applied Medical Biophysics

Third year

General Nursing Science and Art III and  
Clinical Practica III  
Psychiatric Nursing Science and Art I  
and Clinical Practica I  
Introduction to Midwifery  
Social Sciences, Social Care and  
Mental Health Care  
Preventive and Promotive Health Care  
and Family Planning and Practica

Second year

General Nursing Science and Art II and  
Clinical Practica II  
Physiology and Applied Chemistry  
Microbiology, Parasitology, Pathology  
and Pharmacology

Final semester

Psychiatric Nursing Science and Art II  
and Clinical Practica II

(iv) GENERAL NURSE, PSYCHIATRIC NURSE AND MIDWIFE

DIPLOMA FOR REGISTRATION AS A GENERAL NURSE, PSYCHIATRIC NURSE AND MIDWIFE

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over four years.

First year

Nursing Science and Art I  
Social Sciences and Social Care I  
Natural and Biological Sciences I

Third year

Nursing Science and Art III (Intensive  
Nursing Arts)  
Natural and Biological Sciences III  
Psychiatric Therapy II  
Preventive and Promotive Health  
Midwifery I

Second year

Nursing Science and Art II  
Social Sciences and Social Care II  
Psychiatric Therapy I  
Natural and Biological Sciences II

Fourth year

Nursing Science and Art IV  
Midwifery II  
Psychiatric Therapy III (semester  
course)

(v) PSYCHIATRIC NURSE

DIPLOMA FOR REGISTRATION AS A PSYCHIATRIC NURSE

Admission qualifications: A candidate must submit a Standard X Certificate or equivalent certificate; or proof of current registration as a nurse or as a midwife, or proof of current enrolment as a nurse.

Nature and duration of the course: The course extends over three years.

First year

Psychiatric Nursing Science and Art I and  
Clinical Practica I  
Ethos of Nursing  
Introduction to Microbiology, Parasitology and Pharmacology  
Anatomy and Applied Medical Biophysics

Second year

Psychiatric Nursing Science and Art II  
and Clinical Practica II  
Physiology and Applied Chemistry  
Microbiology, Parasitology, Pathology  
and Pharmacology

Third year

Psychiatric Nursing Science and Art III  
and Clinical Practica III  
Social Sciences, Social Care and Mental  
Health Care  
Preventive and Promotive Health Care and  
Family Planning and Practica

(vi) MIDWIFE

DIPLOMA FOR REGISTRATION AS A MIDWIFE

Admission qualification: A candidate must submit proof of current registration as a general nurse or as a psychiatric nurse, or proof of current enrolment as a nurse.

Nature and duration of the course: The course extends over two years.

Subjects

(1) Basic sciences:

- (a) Social Sciences, Social Care and Mental Health Care
- (b) Natural Sciences: Applied Medical Biophysics and Applied Chemistry
- (c) Biological Sciences: Anatomy, Physiology and Microbiology,  
Parasitology and Pharmacology

(2) Science and Art of Midwifery, Neo-natal Care and Mothercraft (from infancy to the pre-school child)

(3) Preventive and Promotive Health Care and Family Planning

(4) Principles of Professional Practice

(5) Ward Administration and Clinical Instruction

(6) Records

Training centres: See Appendix B. p. 221.

Note: See Chapter V for training in Nursing Education at universities.

Vocational service: A particular characteristic of the young prospective nurse who presents herself for training and employment is an idealism which usually arises from a life-long dream. This ideal is achieved when she has successfully completed her training. As a student she has the opportunity of becoming acquainted with all aspects of the occupation; when she becomes a registered nurse, the acquired knowledge is fully utilized and extended so that she renders a service of charity which is in keeping with the nature of all women.

Although the basic needs of patients have remained unchanged, nursing has today become a highly specialized occupation as a result of the phenomenal scientific progress in the field of medicine. The duties and responsibilities of the registered nurse require an extremely high level of training and skill. However, as a result of her comprehensive but intensive training, which also involves the moulding of

personality, the nurse acquires the ability to make decisions, to display sound judgement and to think scientifically. She is consequently able to satisfy the stringent demands which a dynamic society imposes upon her as a nurse and an individual.

Wherever the nurse works - in hospitals, private nursing homes, industrial concerns, clinics, schools, consulting rooms, in the district - there she is concerned with the welfare and health of the individual and the community in general. These duties do not end with the easing of pain or the particular physical defect of the patient. She must also be able to listen and to attempt to understand the troubled mind; to inspire the patient who has lost hope and to lead him to acceptance and resignation if there is no hope of recovery. She must thus have an intense desire to assist and serve her fellow men. This requires intelligence, patience, tact, unselfishness and a sympathetic attitude, but she must still be emotionally stable and able to act firmly if necessary.

There is no doubt about the employment possibilities for nurses. The service which qualified nurses have to render is still expanding as a result of an increase in the number of hospitals and the growth of the population. There are consequently adequate opportunities for promotion. In addition, the nurse has a choice between one or more of several basic and post-basic fields in which she can qualify and realize her potential. Nurses generally work in hospitals but there are many other fields of employment. Provincial and other hospitals, education departments, government departments such as those of Health and Defence, municipalities, medical practitioners and specialists, industrial organizations, etc., all employ nurses. It is nevertheless better and more economical to nurse people at home than to admit them to hospital and for this reason the demand for private nurses will increase in the future.

Further information on training and aspects such as salaries, conditions of service, promotion, etc. can be obtained on request from: The Executive Director, SA Nursing Association, Private Bag X105, Pretoria 0001.

## 16. OCCUPATIONAL THERAPY

### NATIONAL DIPLOMA IN OCCUPATIONAL THERAPY

Admission qualification: A Standard X Certificate (Matriculation Exemption) or equivalent. Mathematics is required and science subjects are strongly recommended.

Nature and duration of the course: The course extends over three years and is offered on a full-time basis. A provisional selection of candidates takes place early in November of the previous year. Towards the end of January students attend an orientation course of one week at the College and then the final selection takes place.

#### First year

##### Examination subjects

Anatomy  
Physiology  
Psychology

##### Additional subjects

Biophysics  
Sociology and Anthropology  
Nursing  
Theory and Practice of Occupational Therapy I

#### Second year

##### Examination subjects

Internal Medicine and Neurology  
Orthopaedics and Surgery  
Psychiatry  
Kinesiology

##### Additional subjects

Psychology (Child, Industrial and Clinical)  
Pathology  
Plastic Surgery  
Paediatrics and Cerebral Palsy  
X-Ray Orientation  
Theory and Practice of Occupational Therapy II

### Third year

#### Examination subjects

Occupational Therapy applied to  
Physical Conditions  
Occupational Therapy applied to  
Psychiatric Conditions  
Theory and Application of Therapeutic Media  
Clinical Practice

#### Additional subjects

Electronics  
Interpersonal Relationships

#### Training centre

Vona du Toit College of Occupational Therapy, Pretoria.

Note: See Chapter V for teacher training in Occupational Therapy at the universities of Pretoria, Stellenbosch and South Africa.

Vocational service: Occupational therapy is a paramedical occupation. It differs from other paramedical services, however, since occupational therapists are trained to treat physically and mentally handicapped persons and that during treatment the patient himself must participate in community activities. The treatment is applied under the guidance of a doctor and the occupational therapist is consequently a member of the medical team. The treatment is also focussed upon the patient's life outside the hospital and upon his future; upon the regaining of his independence, creative ability and particularly his ability to work. The occupational therapist's primary aim is to rehabilitate the patient physically and mentally so that the patient can once more take his place in society.

Qualified occupational therapists have a wide range of jobs to choose from in respect of a large variety of hospitals, institutions and schools for the physically and/or mentally handicapped and persons of all age groups. There are posts available in general, psychiatric, orthopaedic and children's hospitals, rehabilitation centres, special schools and institutions and private nursing homes. Private practices also offer interesting possibilities.

Students at the college receive an annual training grant from the Transvaal Department of Hospital Services. There are no financial or service obligations with regard to this grant on completion of the course. Occupational therapists must be registered with the South African Medical and Dental Council. South African degrees and diplomas in occupational therapy are recognized internationally. Registered members of the South African Association for Occupational Therapists can consequently work anywhere in the world.

The course at the Vona du Toit College of Occupational Therapy, Pretoria, is offered in conjunction with the University of Pretoria and a change-over to a degree course at this university is envisaged. Four-year degree courses in occupational therapy are already being offered by the universities of Cape Town, the Orange Free State, Stellenbosch and the Witwatersrand. All the courses satisfy the same basic requirements for training.

## 17. OPTOMETRY

### DIPLOMA IN OPTOMETRY OF THE SOUTH AFRICAN OPTOMETRIC ASSOCIATION

Admission qualifications: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). A satisfactory pass mark in Mathematics, Science, Biology, English and Afrikaans is a prerequisite. All prospective students must present themselves for an interview at the College prior to admission.

Nature and duration of the course: The course extends over four years of full-time study. It is offered in English and Afrikaans in co-operation with the South African Optometric Association.

Practical training comprises practical work during the second, third and fourth years in the Johannesburg Optometric Clinic which is situated in the College buildings, and also at Alexandra Clinic and Riverlea Clinic.

### First year

Mathematics  
Chemistry  
Physics  
General Optics  
Statistics  
General Anatomy and Physiology

### Third year

Visual Science  
Patho Physiology and Neurology  
Graphical and Analytical  
Ocular Anatomy and Physiology  
Psychology  
Contact Lenses  
Child Vision Care  
Orthoptics  
Ocular Pathology and Perimetry

### Training centre

The Witwatersrand College for Advanced Technical Education.

Vocational service: Optometry is based on scientific knowledge and involves sciences such as ophthalmology, chemistry, physics, anatomy, physiology and psychology. The optometrist of today uses specialized techniques and instruments to trace ocular defects and, if necessary, prescribes spectacles or contact lenses as well as possible corrective eye exercises. He assists the entire family in the preservation and care of healthy eyes and his is one of the professions which a community cannot do without. In addition, it is one of the most remunerative professions, particularly when working hours and conditions are also taken into consideration. It is definitely a challenging occupation which provides ample opportunities for research to those interested.

An optometrist can start his own practice or enter into partnership with an established optometrist. His work may cover all aspects of optometry, or he may decide to specialize in a particular field. In this case, he usually enters a group practice to which a number of optometrists are attached. Others find more satisfaction in working in a clinic or hospital, such as a military hospital.

The optometrist described above is not the same as the oculist or eye specialist. The latter is a medical practitioner who undergoes a few years of specialized university training on completion of his normal medical training in order to practise as an oculist and eye surgeon.

## 18. ORTHOPAEDICS

NATIONAL CERTIFICATE FOR ORTHOPAEDIC TECHNICIANS and

NATIONAL DIPLOMA IN ORTHOPAEDIC TECHNOLOGY

(i) Admission qualification: The admission qualification for the National Certificate Course is a Standard VIII Certificate or any other equivalent certificate which entitles the holder to continue his studies for a Standard X Certificate or an equivalent qualification.

Nature and duration of the course: The course is taken on a full-time basis over three years. The emphasis is mainly on technical, medical and practical training together with clinical experience and further general education.

### First year

Orthopaedic Basic Science C1  
Orthopaedic Workshop Theory C1  
Orthopaedic Workshop Practice C1

### Second year

Orthopaedic Basic Science C2  
Orthopaedic Workshop Theory C2  
Orthopaedic Workshop Practice C2

### Third year

Orthopaedic Basic Science C3  
Orthopaedic Workshop Theory C3  
Orthopaedic Workshop Practice C3  
Human Relations for Orthopaedic Technicians C

Candidates who are in possession of the above certificate and who have passed a practical proficiency test on completion of an additional year of practical training in an approved orthopaedic workshop will be eligible for registration with the SA Medical and Dental Council.

The Certificate also qualifies a candidate for admission to the National Diploma Course in Orthopaedic Technology.

### (ii) NATIONAL DIPLOMA IN ORTHOPAEDIC TECHNOLOGY

Admission qualifications: Candidates must be in possession of the National Certificate for Orthopaedic Technicians and must also have passed in at least 4 subjects (including the two official languages) on a Standard X or an equivalent level.

Nature and duration of the course: The course extends over two years and is provided on a full-time basis. The emphasis is mainly on advanced technical, medical and practical training together with clinical experience and further general education.

#### First year

Orthopaedics T1  
Orthopaedic Workshop Technique and Management T1  
Orthopaedic Workshop Practice T1  
Human Relations for Orthopaedic Technicians T1

#### Second year

Orthopaedics T2  
Orthopaedic Workshop Technique and Management T2  
Orthopaedic Workshop Practice T2  
Human Relations for Orthopaedic Technicians T2

#### Training centres

Training courses are offered at the following provincial hospitals in the Republic:

Red Cross Hospital, Rondebosch, C.P.  
Provincial Hospital, Port Elizabeth, C.P.  
Frere Hospital, East London, C.P.  
Wentworth Hospital, Jacobs, Natal  
National Hospital, Bloemfontein, O.F.S.  
Orthopaedic and Artificial Limb Fitting Centre, Johannesburg, Tvl.  
Orthopaedic Hospital, Pretoria, Tvl.

Vocational service: The orthopaedic technician or technologist does not pursue a trade but, in fact, a highly specialized profession, since the work is performed in close co-operation with, for example, the orthopaedic surgeon. The latter diagnoses the defect or problem, prescribes the treatment and the technician accepts the responsibility for the design, choice of the material and the manufacture of a suitable apparatus, limb or anything else which may be necessary. The technician is thus expected to be thoroughly aware of the defect and also to have a knowledge of the physiology and anatomy of that part of the body where the defect occurs. He must also be acquainted with all the types of material which can be used for the manufacture of equipment.

The work of the orthopaedic technician is generally of a twofold nature, viz the manufacture of artificial limbs and the manufacture of orthopaedic apparatus and aids such as calipers and surgical shoes. The work is performed in well-equipped rooms called workshops, with all the necessary machinery, equipment and material at hand. The workshops are controlled by the provincial administrations and are situated in places such as Pretoria, Johannesburg, Baragwanath, Durban, Pietermaritzburg, Bloemfontein, Cape Town, Port Elizabeth and East London.

It is an excellent occupation for persons who would like to serve their fellow men and who possess a high degree of manual skill.

## 19. PHARMACY

### DIPLOMA IN PHARMACY

Admission qualifications: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics on the Standard Grade and a pass of at least 60% in a science subject on the Higher Grade or the Standard Grade.

Nature and duration of the course: The course extends over four years of full-time study at an institution recognized for this purpose by the South African Pharmacy Board.

The successful candidate must complete a year of practical training in an approved pharmacy before he can be registered as a pharmacist. A person undertaking this training is known as a trainee pharmacist.

#### Pharmacy I

Botany  
Chemistry I  
Physics  
Zoology

OR

Biology  
Chemistry I  
Mathematics  
Physics

#### Pharmacy III

Pharmacology I  
Pharmaceutical Chemistry I  
Pharmaceutics II  
Health Education (half course)

#### Pharmacy II

Chemistry II  
Pharmaceutics I  
Pharmacognosy  
Physiology

#### Pharmacy IV

Pharmacology II  
Pharmaceutical Chemistry II  
Pharmaceutics III  
Pharmacy Administration  
Forensic Pharmacy

#### Training centres

Colleges for Advanced Technical Education: Cape Town, Natal, Port Elizabeth, Pretoria and Witwatersrand.

Vocational service: The pharmaceutical profession, which can be practised by men and women, is very old and has always been held in high esteem since the pharmacist is far more than somebody who sells beauty preparations, novelties and pills. The pharmacist is a professional with professional training of a high standard and his expert knowledge is an indispensable complement to the work of doctors and hospitals. In fact, the pharmaceutical profession today constitutes the co-ordinating link between manufacturer and doctor, doctor and patient, patient and community and in this way an important part of the national health service is controlled.

The pharmaceutical profession is not limited to the well-known community pharmacies which mainly prepare medicines to doctors' prescriptions and which sell patent medicines and other preparations. Pharmacists are also employed by the State, the provincial administrations and the Sick Fund of the South African Railways to work in hospitals, dispensaries and clinics, as well as filling professional administrative posts. Other branches of the profession are the pharmaceutical industry, wholesalers and lecturers in universities and colleges for advanced technical education.

At present there are two qualifications which can be obtained which are recognized for the purpose of registration as a pharmacist. They are the B. Pharm. degree and the Diploma in Pharmacy. The degree can be obtained at Potchefstroom University or Rhodes University at Grahamstown, C.P. and the diploma at a college for advanced technical education. The course and admission requirements for the degree and the diploma are precisely the same and the South African Pharmacy Board regards the degree and the diploma as equivalent for registration as a pharmacist.

Bursaries and/or loans for study in Pharmacy at the two universities and the colleges for advanced technical education are offered, inter alia, by the Foundation for Pharmaceutical Education, P.O. Box 31350, Braamfontein 2017; B.G. Heydenrych Scholarships; F.A.K. study loans; Natal Department of Hospital Services; Transvaal Department of Hospital Services and the South African Railways. In addition, there are also bursaries/loans for study only at a particular university or college. Particulars may be obtained direct from the institution concerned.



## 20. PHYSIOTHERAPY

### NATIONAL DIPLOMA IN PHYSIOTHERAPY

Admission qualification: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with Mathematics and a science subject.

Nature and duration of the course: The course extends over three years of full-time study.

#### Examination subjects

##### First year

Anatomy ) written and  
Physiology) oral

##### Second year

Exercise therapy ) written,  
Electrotherapy ) practical  
Massage and Manipulative Procedures) and oral

##### Third year

###### Written

- Conditions treated by Physiotherapy
- Application of Physiotherapy to Medical Conditions
- Application of Physiotherapy to Surgical Conditions

Practical and oral examination on all aspects of Physiotherapy covered during the three-year training period.

#### Non-diploma subjects

Psychology, Nursing, First Aid, Physical Training

#### Clinical training

A total minimum number of 1000 hours spread over all three years of training, with as much variety as possible. No candidate will be allowed to enter for the final examination until she/he has completed a minimum of 800 hours of clinical training, except where special exemption has been granted and approved by the South African Medical and Dental Council.

#### Training centre

Pretoria College of Physiotherapy.

Note: See Chapter V for teacher training in Physiotherapy at the universities of Cape Town, Pretoria, South Africa and the Witwatersrand.

Vocational service: Medical science has become so comprehensive and complicated nowadays that the doctor is compelled to specialize to an increasing extent and, after the patient has been put on the road to recovery, to entrust him/her to the care of other trained persons. This treatment is in the hands of members of the paramedical occupations, for example those of the physiotherapist and occupational therapist.

Physiotherapy is a service which is supplementary to medical practice. The primary function of the physiotherapist is to help the patient to help himself/herself. To this end, the physiotherapist applies physical means to treat the sick and injured.

The majority of physiotherapists, women as well as men, work in hospitals which provide physiotherapy departments where apparatus and facilities are available for treatment. The physiotherapy department is divided into various areas - one of the busiest being a large gymnasium where individual and group treatment is given. It is here that progressive exercise programmes and final rehabilitation programmes are carried out. A pool is available for the treatment of patients in warm water. Other areas are allocated for treatment using techniques such as exercise therapy, electrotherapy, massage, and the application of heat and cold and mechanical traction. Patients who are not well enough to attend the department are treated in the wards. The wards in a general hospital in turn offer a great variety of work, for example,

orthopaedic, medical, surgical, and children's wards as well as the intensive care wards.

Apart from working in a general hospital, other avenues open to the physiotherapist include employment in a maternity home, rehabilitation centres, centres for the treatment of cerebral palsied children, geriatric units, or in industry and private practice (physiotherapy clinics).

The course of the Pretoria College of Physiotherapy is offered in conjunction with the University of Pretoria. Training for the B.Sc. degree in Physiotherapy (4 years) is offered at the universities of Cape Town, the Orange Free State, Stellenbosch and the Witwatersrand. Particulars can be obtained directly from the universities.

Registration as a physiotherapist with the South African Medical and Dental Council is compulsory.

## 21. POLLUTION CONTROL

- (i) NATIONAL CERTIFICATE IN NOISE CONTROL
- (ii) NATIONAL CERTIFICATE IN AIR POLLUTION CONTROL
- (iii) NATIONAL CERTIFICATE IN WATER POLLUTION CONTROL
- (iv) NATIONAL DIPLOMA IN POLLUTION CONTROL

The Diploma will be awarded after the three certificates mentioned above have been obtained.

Admission qualifications for the Certificate courses: A qualification in public health or an appropriate university degree recognized by the Department of National Education for this purpose or registration as a Health Inspector with the South African Medical and Dental Council and

at least two years' experience in a health department or pollution control section of a local authority, Government department or body approved by the Department of National Education.

Nature and duration of the courses: Candidates must enrol for the appropriate correspondence course offered by the Witwatersrand College for Advanced Technical Education.

A candidate may enrol for only one certificate course in any one year.

- (i) NATIONAL CERTIFICATE IN NOISE CONTROL

### Subjects

Physics of Sound  
Noise Measurement  
Acoustics and Noise Control (Elementary review)  
Elementary Anatomy, Physiology and Pathology of the ear  
Accommodation for Audiometry  
Audiometric records  
General problem of industrial deafness  
Ear protection  
The role of the authorities with regard to the management and control of noise  
Practical

- (ii) NATIONAL CERTIFICATE IN AIR POLLUTION CONTROL

### Subjects

Introduction  
Air Pollution and the community  
Meteorological conditions and air pollution  
Effects of Air Pollution  
Odours  
Sources of Air Pollution  
Control Apparatus  
Control of Air Pollution  
Measurement of Pollution

Subjects (continued)

Radio-activity and Pollution  
Practical

(iii) NATIONAL CERTIFICATE IN WATER POLLUTION CONTROL

Subjects

Water sources  
Standards for water sources  
Causes and sources of water pollution  
Analysis of water  
Influence of pollution on the ecological structure of the water environment  
(Fresh water and sea water)  
Prevention and control measures against pollution  
Water purification  
Practical

Vocational service: Practically all sectors of the community are threatened by air and water pollution and excessive noise, but the problem is most acute in urban and industrial areas. The authorities are thoroughly aware of the injurious effects of pollution and in recent times combating it has developed into an essential supplementary health service. For this purpose trained persons are employed by, among others, government departments, e.g. those of Health, Community Development and Planning and the Environment; larger municipalities, the building industry, Iscor and other industries.

22. RADIOGRAPHY

NATIONAL DIPLOMA IN RADIOGRAPHY

Admission qualifications: Candidates must be at least 17 years of age and in possession of a Standard X Certificate or a certificate recognized by the Department of National Education as equivalent to it. A pass in Mathematics and in at least one science subject is essential.

Nature and duration of the course: The course extends over three years of full-time study. It includes lectures, demonstrations and practical training. Students may qualify in any one of the three fields of study, viz Diagnostic, Therapy and Nuclear Medicine. After successful completion of the three-year diploma course, a student may achieve an additional diploma qualification by completing appropriate training in one of the remaining options during a further period of eighteen months. Credit will be given for the subjects covering the common portion of the course for the original diploma.

Part I (First year): Common to all three fields of study

Major subjects

Anatomy, Physiology and Pathology I  
Radiation Techniques I

Minor subjects

Physics  
Radiation Physics and Protection  
Image Recording I

Part II (Second year)

Major subjects

Anatomy, Physiology and Pathology II  
Radiation Techniques II  
Applied Nuclear Medicine I

Field of study

All three fields  
Diagnostic and Therapy  
Nuclear Medicine

Minor subjects

Equipment I  
Radiotherapy, Physics and  
Equipment  
Nuclear Medicine Instrumentation

Diagnostic  
Therapy  
Nuclear Medicine

### Minor subjects (continued)

Image Recording II	Diagnostic
Care of Patient	Therapy
Biochemistry	Nuclear Medicine

### Part III (Third year)

#### Major subjects

Anatomy, Physiology and Pathology III	Diagnostic and Therapy
Nuclear Medicine Theory	Nuclear Medicine
Radiation Techniques III	Diagnostic and Therapy
Applied Nuclear Medicine II	Nuclear Medicine

#### Minor subjects

Specialised Equipment	Diagnostic
Radiobiology and Oncology	Therapy
Physioradiopharmacology	Nuclear Medicine

#### Training centres

Groote Schuur Hospital, Observatory, C.P.  
Tygerberg Hospital, Tiervlei, C.P.  
Provincial Hospital, Port Elizabeth  
Frere Hospital, East London  
Addington Hospital, Durban  
King Edward VIII Hospital, Durban  
General Hospital, Johannesburg.

Vocational service: Each of the three branches of radiography, viz radiographic diagnosis (examination of a patient with the aid of X-ray apparatus), radiotherapy (X-ray treatment of outwardly invisible ailments) and nuclear medicine (application of nuclear products for medical purposes), is interesting. They include a variety of duties which must be carried out in co-operation with doctors and hospital officials but mainly under the supervision and according to the prescription of a radiologist. (The radiologist is a qualified medical practitioner who has also specialized in radiotherapy and/or radiographic diagnosis.)

The occupation is normally practised by women. There is, however, a great need for men and favourable prospects exist. Misconceptions concerning X-rays, their use and attendant dangers have in the past caused hesitation in the minds of persons interested in this occupation. Today, however, adequate precautionary measures are taken to protect the radiographer against possible radiation and the occupation is thus absolutely safe.

Radiographers are employed by all the hospitals in the country and the doubly qualified radiographer in particular should experience no difficulty in obtaining a suitable post. Many radiographers are also appointed in the private practices of radiologists. The South African qualification is recognized internationally and the double qualification in particular paves the way for experience abroad.

Diploma courses in radiographic diagnosis and radiotherapy can also be taken at the universities of Pretoria and the Orange Free State. Further particulars can be obtained direct from the two universities.

## 23. TROPICAL HYGIENE

### NATIONAL DIPLOMA IN TROPICAL HYGIENE

Admission qualifications: A candidate must be in possession of the National Diploma for Health Inspectors or the Certificate for Health Inspectors of the Royal Society of Health or other examining body recognized by the Department of National Education.

Nature and duration of the course: The training consists of

- attendance of at least 50 lectures of one hour each at an approved college for advanced technical education or technical college over a period of not less than six months;
- not less than 20 practical demonstrations, comprising visits to premises etc.;
- and two weeks' practical field work in a tropical or subtropical area where this work is carried out.

## Subjects

The Climatology and Physical Environment of the Tropics  
Settlement in the Tropics  
Water Supplies  
Disposal of Waste Products  
Personal Hygiene  
Dietetics, Nutrition and Food Control  
Communicable Diseases, including Vector Borne Diseases  
Disinfestation and disinfection  
Care of Transport and Animals in the Tropics  
Health Administration in the Tropics

## Training centres

Colleges for Advanced Technical Education.

Vocational service: This course is primarily intended for qualified health inspectors who are interested in furthering their studies and obtaining particular knowledge of hygiene in tropical and subtropical regions of the country. It is a specialized course which involves considerable practical field-work and which makes provision for a study of the promotion of the health of people, as well as the care of animals.

Municipalities situated in these regions make use of the services of these persons. Outside the municipal boundaries, however, the Department of Health, in co-operation with other departments and provincial authorities, is responsible for combating diseases and for the general health services in the interests of man and animals. Persons with training in tropical hygiene are mainly employed by this Department.

## D. OTHER TRAINING SCHEMES

### 1. AGRICULTURAL DIPLOMAS

#### AGRICULTURAL COLLEGES

General information: The Republic of South Africa is divided into seven agro-ecological regions. Each of five of these regions has an agricultural college under the jurisdiction of the Department of Agricultural Technical Services. The main purpose of the colleges is to train young men as farmers, farm managers or agricultural officers.

The syllabi include the more important branches of farming in the country, with special emphasis on the agricultural conditions in the specific agro-ecological region which the college serves.

In addition to the diploma courses, the colleges offer SPECIAL COURSES for bona fide farmers. These courses vary in duration from a few weeks to approximately three months. This more specialized training is supplementary to diploma training.

Another form of agricultural instruction is the SHORT COURSE, which lasts from a few days to about a week. These courses are mainly intended as refresher courses for farmers.

Since the closing dates for applications and admission qualifications vary from college to college, prospective students are advised to obtain further particulars timeously from the colleges. The addresses appear on p.214.

#### (i) TWO-YEAR AGRICULTURAL DIPLOMA COURSES

All the agricultural colleges offer the two-year diploma course.

#### (a) Cedara College of Agriculture, Natal

The College is situated in the Natal Midlands, 16 km north of Pietermaritzburg on the National Road.

Admission qualification: Candidates must be at least 16 years old and in possession of a Standard X Certificate. Preference is given to candidates who are better qualified, e.g. with post-school training and practical farming experience.

Applications for admission on the prescribed forms must be received by the College not later than 30 January of the year for which application is made.

Nature and duration of the course: The course extends over a two-year period, commencing in October and ending in September two years later.

The Junior year and one term of the Senior year are devoted to a sound training in the theory and practice of agriculture, while the remaining three terms are concerned mainly with the improvement of managerial qualities and the development of a well balanced personality.

Although the training deals with the most important facets of farming in Southern Africa, the intensive farming enterprises of Natal are emphasized.

Junior year

Theory

Animal Husbandry  
Agronomy  
Agricultural Economics  
Agricultural Engineering  
Pastures  
Soil Science  
Veterinary Science

Practicals

Animal Husbandry  
Agronomy  
Students' Farm  
Economics  
Engineering  
Pastures  
Soil Science

Senior year

Theory

First term

Animal Husbandry  
Agricultural Economics  
Pastures  
Humanities

Practicals

Animal Husbandry  
Economics  
Farm Management

Assignments

Farm plan  
Ecology assignment  
Record book (Students' farm)  
Seminars (three)

Second, third and final term

Agricultural Engineering  
Agricultural Economics  
Agronomy

Labour Management:

Bantu law and custom  
Nutrition and housing  
First Aid  
Humanities

(b) College of Agriculture, Potchefstroom, Transvaal

The College, which is situated south-west of Potchefstroom, is only about 5 km from the business centre of the town.

Admission qualification: The minimum age for admission is 16 years on 1 January of the year applied for.

The minimum admission qualification is a Standard X Certificate or equivalent. Higher educational qualifications and appropriate post-school experience will definitely be given preference.

Preference is given to applicants from the Highveld Region.

Applications for admission on the prescribed application forms must reach the Director of the College as soon as possible, but not later than the first week in November of each year.

Nature and duration of the course: Each year of study extends from middle January to the middle of November. The main purpose of the course is the thorough training of future farmers in the scientific principles and practical aspects of farming in order to promote optimal utilization of the soil with special reference to conditions in the Highveld Agricultural Region. The course is offered by means of lectures, demonstrations and practical classes in the various enterprises of farming and related sciences.

No choice of subjects is offered but, owing to the nature of farming in the Region, two major fields are studied, viz Agronomy and Animal Husbandry.

### First year

#### Basic Crop Production

General Botany  
Environmental factors  
Soil cultivation  
Weed control  
Entomology  
Plant Pathology  
Fodder conservation

#### Soil Science

Soil physical factors  
Chemical and biological factors  
Soil formation and classification  
Soil fertility  
Irrigation criteria

#### Agricultural Engineering

Farm buildings  
Water provision on the farm  
Soil conservation  
Irrigation and drainage  
Surveying  
Tractors and engines  
Agricultural implements  
and equipment

#### Pasture Science I

Plant growth forms  
Characteristics of grass veld  
Veld management

#### Agricultural Economics

Concepts and production factors  
Principles of Production Economy  
Financial management  
Agricultural credit  
Marketing economics  
Agricultural policy  
Agricultural law

#### Basic Animal Production

Basic nutrition:  
Nutrients  
Digestion  
Nutritive value  
Balancing of rations  
Production Physiology:  
Reproduction  
Milk secretion  
Growth and development  
Carcass quality  
Basic breeding:  
Qualitative heredity  
Quantitative heredity  
Basic Biometry

### Second year

#### Agronomy Crops

#### (Summer Rainfall Region)

Maize  
Sunflower  
Groundnuts  
Grain sorghums  
Winter cereals  
Dry beans  
Potatoes  
Soybeans  
Cotton  
Buckwheat  
Fodder crops  
Tuberous fodder crops and kale

#### Large Stock Production

Beef production:  
Ecology  
Breeding  
Nutrition  
Management  
Dairy cattle production:  
Breeding  
Nutrition  
Management  
Hygienic milk and cream production  
Pigfarming:  
Breeding  
Nutrition

Horticulture

Fruit production  
Vegetable production

Advanced Mechanisation

Power application costs  
Mechanical systems and processes  
Mechanisation planning

Farm Safety

General principles  
Safeguarding various aspects  
Legislation and organisation

Pasture Science II

Planted pastures:  
  Pasture species  
  Pasture establishment  
  Pasture and grazing management  
Radical veld improvement

Agricultural Organisation Studies

The farming community  
Group dynamics  
Leadership  
Meetings and public speaking  
Agricultural organisations

Large Stock Production (continued)

Grading  
Management

Small Stock Production

Merino sheep  
Wool Technology  
Mutton production  
Management of sheep  
Breeding of sheep  
Nutrition of sheep  
The Boer Goat

Poultry Production

Nutrition, breeding and management  
  of poultry  
Production of eggs and broilers

Animal Health

Anatomy and physiology  
Diseases of cattle, sheep, horses,  
  pigs, dogs and poultry  
Poisoning  
Parasites  
First Aid on the farm  
Artificial insemination

(c) Elsenburg College of Agriculture, Stellenbosch, Cape Province

The College is situated in the Winter Rainfall Region about 11 km from Stellenbosch.

Admission qualification: Applicants must be at least 16 years old. The minimum requirement for enrolment is:

- Standard X or its equivalent
- Standard IX plus one year's experience
- Standard VIII plus two years' experience.

Farming experience will be a recommendation.

Applicants must be of good character and in a sound state of health, free from any defect or disease likely to prevent them from doing practical work.

Applications for admission to the course must be made on the prescribed forms and be accompanied by health and good conduct certificates. The completed application forms must reach the Director before 30 September of the year preceding the one for which application is made.

Nature and duration of the course: The course commences towards the end of January in the first year and closes early in November in the second year. Training is given by means of lectures, demonstrations and practical work in the major branches of farming.

Students have a choice from the following three main fields, viz  
Field Husbandry - Animal Production; Viticulture - Animal Production;  
Viticulture - Pomology - Field Husbandry. Each of these courses is entirely continuous for two years.

Field Husbandry - Animal Production

Basic Animal Production  
Animal Husbandry in the Winter Rainfall Region  
  (Beef Cattle, Dairy Cattle, Dairying, Pigs)  
Small Stock Production in the Winter Rainfall  
  Region (Sheep and Wool)



Field Husbandry - Animal Production (continued)

Poultry Science  
Animal Health (Veterinary Science)  
Basic Crop Production  
Field Husbandry in the Winter Rainfall Region  
Field Husbandry in the Summer Rainfall Region  
Pasture Science  
Soil Science  
Soil Science B  
Agricultural Engineering  
Agronomy Engineering  
Animal Husbandry Engineering  
Agricultural Economics  
Organization and Management

Viticulture - Animal Production

Basic Animal Production  
Animal Husbandry in the Winter Rainfall Region  
(Beef Cattle, Dairy Cattle, Dairying, Pigs)  
Small Stock Production in the Winter Rainfall  
Region (Sheep and Wool)  
Poultry Science  
Animal Health (Veterinary Science)  
Basic Crop Production  
Vineyard Cultivation  
Wine making  
Pasture Science  
Soil Science  
Soil Science A  
Agricultural Engineering  
Viticultural Engineering  
Animal Husbandry Engineering  
Agricultural Economics  
Organization and Management

Viticulture - Pomology - Field Husbandry

Genetics (Part of Basic Animal Production)  
Poultry Science  
Basic Crop Production  
Deciduous fruit  
Other fruit cultivars  
Vineyard Cultivation  
Wine making  
Vegetable Growing  
Field Husbandry in the Winter Rainfall Region  
Field Husbandry in the Summer Rainfall Region  
Tobacco Growing  
Soil Science  
Soil Science A  
Soil Science B  
Agricultural Engineering  
Agronomy Engineering  
Pomology Engineering  
Viticulture Engineering  
Agricultural Economics  
Organization and Management

(d) Glen College of Agriculture, Orange Free State

Glen College of Agriculture and Research Institute is situated some 24 km north of Bloemfontein near the Modder River.

Admission qualification: A Standard X Certificate or equivalent. Applicants must be of good character, healthy and capable of doing practical work.

Nature and duration of the course: A continuous two-year diploma course is offered. Enrolment of students will take place every alternate year. The course commences on the last Tuesday of January and continues up to Diploma Day, which falls in the last week of November in the second year. The syllabus embraces all the more important branches of farming in South Africa with special emphasis on agricultural conditions in the Orange Free State Region, namely mixed farming.

#### Subjects

Basic Animal Production: Nutrition, Breeding, Physiology

Large Stock Production: Beef Cattle, Dairy Cattle, Dairy Science, Pigs

Small Stock Production: Mutton Sheep and Meat Production, Merino sheep, Wool technology, Sheep management, Sheep nutrition, Sheep breeding, Performance Testing, Boer goats, Karakuls

#### Animal Health

Pasture Science: Grassveld, Karroo and Macchia, Bushveld, Cultivated pastures, Veld reclamation

Basic Crop Production: Agricultural botany, Morphology, Physiology, Plant genetics, Taxonomy, Environmental factors, Soil cultivation, Weed control, Fodder conservation, Entomology, Plant Pathology

Agronomy (Summer rainfall) Agricultural Engineering

Horticulture (General): Agricultural Economics

Fruit, Vines and vegetables

Organization and Management

Soil Science

#### (e) Grootfontein College of Agriculture, Middelburg, Cape Province

The College is situated in the Karoo region approximately 5 km north of Middelburg, C.P.

Admission qualification: Applications for admission to the course must be made on the prescribed forms and must reach the College on or before 31 October of the year preceding that for which application is made.

Candidates must be at least 16 years old. The minimum qualification for admission is the Standard X or equivalent certificate. Preference will, however, be given in the selection of students to candidates with higher educational qualifications and/or experience of farming.

Nature and duration of the course: Each year of study extends from January to the end of November.

Because of the nature of its climate, rainfall and vegetation, the Karoo Region is eminently suited for extensive sheep farming.

The emphasis in the curriculum for the Diploma course and for the other courses offered at Grootfontein consequently falls on the small stock industry, on veld management, fodder crop production and soil conservation.

In the first as well as the second year there is no choice of subjects.

#### First year

##### Animal Science

Sheep Theory

Wool Theory

Animal Breeding

Principles of Feeding

Veterinary Science

Angora Goats and Mohair

Large Stock and Pigs

#### Second year

##### Animal Science

Sheep Theory

Wool Theory

Animal Breeding

Veterinary Science

Sheep Management

Feeding of Sheep

Angora Goats and Mohair

Veld Management and the Production  
of Crops

Veld Management  
Agronomy  
Agricultural Economics

Agricultural Engineering

Introduction  
Hydraulics  
Basic principles of soil conservation  
Building Science  
Mechanization  
Metallurgy  
Irrigation and Drainage  
Water supply on the farm  
Electricity

Veld Management and the Production  
of Crops

Veld Management  
Agronomy  
Agricultural Economics

(ii) SPECIAL COURSES : GLEN COLLEGE OF AGRICULTURE, O F S

In addition to various short courses which are offered annually, the College offers two special courses, namely a Diploma Course in Dairying and a One-month Course in Sheep and Wool.

DIPLOMA IN DAIRYING

Admission qualification: Applicants must be in possession of at least a Standard VIII Certificate and at least 16 years old.

Nature and duration of the course: The course comprises an Introductory Course and an Advanced Course, each of which extends over 17 weeks. The two courses must be taken in successive years. In the period between the courses the candidate must work in an approved Dairy Factory or institution and must submit a satisfactory report on the work undertaken there within 14 days of the commencement of the Advanced Course.

Subjects

The Introductory Course: Milk, Cream, Analyses, Microbiology, Animal Husbandry, Engineering, Chemistry.

Advanced Course: Cheese Making, Butter Making, Other Dairy Products, Economics.

Three short courses, namely Milk Testing, Cream Testing and Cream Grading are included in the Diploma Course and students who pass these sections will be issued with the relevant certificate.

ONE-MONTH COURSE IN SHEEP AND WOOL

Admission qualification: Applicants must be at least 18 years of age. Applicants who have had continuous post-school experience on a sheep farm, or who possess a diploma from a College of Agriculture will receive preference when candidates are selected for enrolment.

Nature and duration of the course: The course is offered during the month of April.

Syllabus: The syllabus is divided into various sections on which examinations are set.

- |                              |                                     |
|------------------------------|-------------------------------------|
| I Sheep Theory               | III Feeding and Management of sheep |
| Wool Production (the Merino) | IV Hides and Skins                  |
| Mutton Production            | V Practical Work with Sheep         |
| Breeding                     | Sheep                               |
| II Wool Theory               | Wool                                |

2. ARCHIVAL SCIENCE

NATIONAL DIPLOMA IN ARCHIVAL SCIENCE

Admission qualification: At least a Bachelor's degree. A B.A. degree with History as a major subject is a requirement for appointment in the Government Archives.

Applications: Applications for admission to the course must reach the Director of Archives, State Archives, Private Bag X236, Pretoria 0001, at least two months prior to the commencement of the academic year. (The academic year commences on 1 February.)

Nature and duration of the course: The course extends over two academic years and comprises a theoretical and a practical part. A study guide dealing with the theoretical part is made available to each candidate.

Subjects (Theoretical part)

Archival Science I and II  
Archives Legislation and Regulations  
Sources

Practical part

A candidate must submit an inventory, together with an introduction, of a medium-sized archives group or accession which he has personally classified and described. The oral examination in paleography consists of the reading of prescribed texts from original sources, as well as questions concerning the development of paleography.

Training centre

The State Archives, Union Buildings, Pretoria.

Vocational service: This specialized course makes provision for those with an aptitude in archivalia inside archives depots as well as outside them, e.g. in libraries, churches, museums, universities and so forth. Persons employed in the Public Service enjoy the advantage of not paying any tuition fees. Enquiries in connection with the study guide and a possible field of employment must be directed to the Director of Archives at the above-mentioned address.

3. AVIATION

(i) AERADIO TECHNICIAN

NATIONAL DIPLOMA FOR TECHNICIANS

Admission qualification: A Standard X Certificate with Mathematics and at least one of the subjects Physical Science, Physics, Chemistry and Mechanics.

Nature and duration of the course: The course extends over four years, i.e. two years of theoretical training at the Witwatersrand College for Advanced Technical Education and two years of practical in-service training at Jan Smuts Airport.

First trimester

Mathematics T1  
Principles of Electricity T1  
Applied Mechanics T1  
Engineering Drawings T1  
General Studies T1

Second trimester

Physics B T1  
Workshop Technology T1  
Mathematics T2  
Electronics T2  
General Studies T2

Third trimester

Principles of Electricity T2  
Communication Electronics T2  
Physics B T2  
Workshop Technology T2

Fourth trimester

Mathematics T3  
Electronics T3  
Communication Electronics T3  
Automatic Control T3

Fifth trimester

Calculation Techniques T3  
Micro-wave Techniques T3  
Industrial Electronics T4  
Radio Communication T4  
General Studies T3

Sixth trimester

Calculation Techniques T4  
Electronic Readings T4  
Audio-engineering T4  
Micro-wave Techniques T4

Vocational service: Anyone who is interested should first apply to the Department of Transport, Pretoria, for appointment as a Pupil Aeradio Technician. Before being admitted to the course, a candidate is required to enter into an agreement to serve the State for at least three years after completion of his training.

The Aeradio Engineering Section of the Division of Civil Aviation, which falls under the Department of Transport, is responsible for the provision of radio, telecommunication and navigational aid equipment at all the main airports in the RSA and SWA, as well as at various points along the main air routes. Aeradio technicians are mainly responsible for the installation, maintenance, testing and periodic overhauling of this equipment. They also assist the engineers in the planning and maintenance of all radio communication systems of the Weather Bureau. Although the work is of a highly responsible nature, it is interesting and varied.

Posts for these technicians exist at the head office in Pretoria as well as at all the main airports in the country. The line of promotion is as follows: Senior Technician, Chief Technician, Control Technician and Chief of Radio Technical Services.

## (ii) AIR TRAFFIC CONTROLLER

Admission qualifications: Candidates must be in possession of a Standard X Certificate or equivalent, preferably with Mathematics. They have to undergo a physical examination for air traffic controllers and pass an aptitude test. Air traffic controllers must have normal colour perception, good hearing and eyesight.

Nature and duration of the course: Training extends over a period of three years.

### First year

- A six-week introductory course to familiarise trainees with aviation terms and conditions so that they can intelligently absorb what takes place in the Air Traffic Control Centres. This course includes Air Traffic Control, Navigation, Theory of Radio, Meteorology and International Civil Aviation Organization;
- a six-week course in communications.

### Second year

- Four weeks' training in Aerodrome Flight Information Service (AFIS);
- assistance at Air Traffic Control Centres.

### Third year

- Assistance at Air Traffic Control Centres;
- the revision of all work previously done and writing of final examinations for the Tower Rating after six weeks' intensive training.

(Throughout the foregoing period written progress tests are conducted and the practical progress of the trainee is assessed.)

Air Traffic Controllers who pass the final examination and have obtained satisfactory marks in the assessments preceding the final course, will be eligible for the immediate issue of the Air Traffic Controller Certificate of Competence if they are over 21 years of age, or on reaching 21 years.

Before being admitted to the course, trainees are required to enter into an agreement to serve the State for a period of at least three years after the completion of their training.

### Training centres

Theoretical training is given at the Jan Smuts Airport near Kempton Park.

Practical training is given at the various airports, viz: Jan Smuts, Kempton Park; Louis Botha, Durban; H.F. Verwoerd, Port Elizabeth; D.F. Malan, Cape Town; and J.B.M. Hertzog, Bloemfontein.

Vocational service: Passengers boarding an aircraft usually feel secure in the knowledge that experts are at the helm. Among the highly trained ground personnel who watch over every aspect of the aircraft's progress in flight are the many air traffic controllers. Their most important task is to promote air safety by eliminating collisions, in particular, and ensuring an orderly flow of air traffic. This is done with the aid of modern navigational aids, of which direction finders and radar are the most important.

Candidates who are interested in this career are employed by the Department of Transport directly after passing Standard X. Trainees must enter into agreement

to serve the State for a period of three years after completing their training. Promotions to the higher grades also naturally depend on the candidates' ability but they can rest assured that meritorious work does not go unrewarded. The normal line of promotion is as follows: Assistant Air Traffic Controller, Air Traffic Controller, Chief Air Traffic Controller, Control Air Traffic Controller and Special Grade Control Air Traffic Controller.

(iii) PILOT AND NAVIGATOR

(a) SOUTH AFRICAN AIR FORCE

For the training of pilots and navigators in the SA Air Force, see p. 171.

(b) PRIVATE REGISTERED FLYING CLUBS

Persons who wish to undergo private training as pilots, must be at least 17 years of age before they can apply for a learner pilot's licence and they must also fulfil strict medical requirements.

Pilots of the South African Airways must already be in possession of a commercial pilot's licence to be appointed as a pilot.

Training: Basic training in flying can only be obtained in two ways, namely through training offered by private registered flying clubs or in the South African Air Force.

All pilots' licences, except those for flight personnel attached to the SA Air Force (military pilots) are subject to the provisions of the Aviation Regulations issued by the Department of Transport, Civil Aviation Division. The following licences can be obtained on these conditions:

- Learner pilot's licence
- Private pilot's licence
- Commercial pilot's licence
- Senior Commercial pilot's licence
- Air-line Transport pilot's licence.

Applicants for the award of the other licences must pass an examination in certain technical subjects. The subjects deal with the general principles of flying and the type of aircraft in respect of which application has been made. A certain number of prescribed flying hours are required for the award of pilots' licences.

Pilots' licences have only a certain period of validity and must be renewed from time to time. A Pupil pilot receives theoretical and practical training before he can undertake solo flights. After his training he must pass an oral examination.

Training at private registered flying clubs is an expensive undertaking since there are expenses attached to the award of licences, the periodical renewal of licences, medical and other physiological examinations, examination fees and so forth.

(c) SOUTH AFRICAN AIRWAYS

It has already been mentioned that pilots in the S.A. Airways are appointed on condition that they hold a Commercial Pilot's licence. In addition they must hold a Standard X Certificate, be under the age of 35 years and South African citizens.

The training pilots have to undergo in the S.A. Airways thus comprises advanced training to make them more efficient, to enable them to handle bigger aircraft and to fulfil increased demands. Their training includes change-over courses when they change over from a smaller to a bigger aeroplane as well as six-monthly repetition courses for the renewal of licences.

All pilots, whether private or attached to either the S.A. Airways or the S.A. Air Force, must be in constant practice, and in addition they have to receive advanced training when they change over from a smaller to a bigger aircraft.

Vocational service: The first highlight of note in the history of aviation was attained in 1905 when the Wright brothers flew a distance of 39,43 km and kept their primitive little aeroplane in the air for all of thirty minutes. Louis Bleriot subsequently flew across the English Channel in 1909. In May 1927 Charles Lindbergh made a solo flight of 33 hours from America over the Atlantic Ocean to Paris in France, an achievement which can still be described as fantastic. Aviation has since made phenomenal progress throughout the world and it is the dream of many a boy to handle one of the modern streamlined jet aircraft at breathtaking speed for hours on end and even to shoot into space on his way to the stars.

Aviation in South Africa can be divided into three aspects: Private or amateur aviation, commercial and operational aviation (South African Airways) and military aviation (South African Air Force). With the exception of military aviation, all aviation is controlled by the Civil Aviation Division of the Department of Transport. In this country, aviation is still a new development but it is playing an increasingly important part in times of war and peace in modern society. For this reason, the opportunities for promotion in this field are extremely attractive. The pilot has a highly responsible task but in comparison with other occupations to which the same disadvantages are attached, for example the possibility of accidents, irregular working hours, etc., his reward for services rendered is excellent. In addition, the occupation holds a challenge for those who feel a strong urge for adventure in faraway places.

Further particulars on training can be obtained from the SA Air Force or the Department of Transport, Civil Aviation Division. The Aviation College of South Africa offers correspondence courses for the theoretical requirements for some licences. Classroom instruction for professional qualifications is also offered by Aeronav Academy and Durban Aviation College.

#### 4. CHRISTIAN MINISTRY

##### DIPLOMA IN CHRISTIAN MINISTRY

(The introduction of a Senior Diploma Course is being planned.)

Admission qualification: A Standard X Certificate or equivalent.

Nature and duration of the course: The course extends over three years and includes academic tuition as well as intensive practical training.

<u>First year</u>	<u>Second year</u>	<u>Third year</u>
Social Work	Social Work	Social Work
Psychology	Psychology	Psychology
Sociology	Sociology	Sociology
Theology	Theology	Theology
Philosophy		
Household Management		

##### Training centre

Huguenot College of the Dutch Reformed Church, Wellington, C.P.

Remark: The degree of Bachelor of Diaconology (B.Diac.) is conferred by the University of South Africa on students trained by the College who pass the College examinations in accordance with requirements stipulated by the University. The University does not require inclusion of the subjects Philosophy and Household Management for degree purposes, but the College regards the content of these subjects as essential for the professional development of its students, and the two subjects are therefore a compulsory part of the College training programme. The other subjects for the degree are the same as those for the diploma and the degree course also extends over three years.

Vocational service: This course was originally initiated to meet the requirements of the lay ministry of the Dutch Reformed Church, but is also accepted as a qualification for staff appointments in various other fields. Persons in possession of the degree or the diploma are registered by the National Welfare Board as professional social workers, and in the Dutch Reformed Church they are employed in the Charitable Services of the Church and also in Mission and Evangelization Work. Considerable numbers of the ex-students of the College are also appointed as social workers in the employ of the Government, e.g. in the Departments of Social Welfare and Pensions, Prisons, the Defence Force, Posts and Telecommunications; in the voluntary welfare services such as family and child welfare services, services for the physically and mentally handicapped, alcoholics, the aged, etc. and in hospitals and industry.

Bursaries and loans are awarded as follows:

- Merit awards of R50 per annum to all first-class matriculants;

- Total Bursaries of R50 per annum are annually awarded to a second-year and third-year student for meritorious work at the Huguenot College;
- bursaries of varying amounts, to a maximum of R500 per annum, to students requiring assistance who work satisfactorily and who apply for such bursaries;
- loans to a maximum of R500 per annum.

## 5. FORESTER

### DEPARTMENT OF FORESTRY

#### DIPLOMA IN FORESTRY

Admission qualifications: The educational qualification for appointment as a pupil forester is a Standard X Certificate or equivalent with both official languages as subjects. Candidates must have a pass at at least Standard 7 level in Mathematics, but preference will be given to those with a pass in Mathematics at the Standard 10 level.

Nature and duration of the course: The in-service training of pupil foresters, which extends over a period of four years, consists of three phases:

- (i) One year of practical field training at one of the State Forests;
- (ii) two years of theoretical training at the College for Foresters at Saasveld, George; and
- (iii) an additional year of practical field training. After successful completion of the course at Saasveld, pupil foresters are posted to various State Forests for their fourth year of in-service training, where they serve as assistant foresters in a sphere considered to be best suited to their aptitudes, viz plantation management, mill management, research or work study.

#### Theoretical training

##### Second year

Silviculture I  
Nursery Practice  
Forest Botany  
Forest Protection  
Forest Mensuration  
Building Construction and Equipment  
Administration I  
Nature Conservation

##### Third year

Silviculture II  
Forest Management  
Forest Exploitation  
Forest Utilization  
Plane Surveying  
Forest Law  
Accounting Procedures  
Administration II

Instruction is given in both official languages. Pupil foresters receive a full salary during their training period. Students are required to pass in all the subjects.

After successful completion of both the practical and the theoretical training, a Diploma in Forestry is awarded to pupil foresters.

After pupil foresters have been offered an appointment and before assuming duty in the Department of Forestry they are required to enter into a contract whereby they undertake to serve the Government for a period of at least three years upon completion of their training.

Vocational service: A clear distinction must be drawn between a Forestry Officer and a Forester. A Forestry Officer is someone who has obtained a four-year B.Sc. degree in Forestry at the University of Stellenbosch. His functions in the Department of Forestry are, inter alia, the management of Government plantations and nurseries, indigenous forests, nature reserves, Government wood processing installations; research; guidance to the public and so forth. Forestry officers are thus expected to plan and control the activities of the forestry industry. Professional officers can attain the highest positions in the Department.



A Forester, on the other hand, does not pursue a degree course but is trained for the Diploma in Forestry at the College for Foresters, Saasveld, approximately 10 km from George. Interested persons should apply to the Department of Forestry for appointment as Pupil Foresters. The in-service training of pupil foresters is offered free of charge and trainees are on full pay throughout the entire period. On obtaining the Diploma, the pupil forester is considered for promotion to the rank of Forester and he can then advance to Senior Forester, Chief Forester and later to Control Forester.

Most foresters work on forest reserves where they are responsible for all forestry activities. Forest reserves and sawmills are situated mainly along the eastern coastal regions or in the Eastern Transvaal. They are generally not near cities or towns but well-equipped living quarters are available at a very low rental.

One of the aims of the national promotion programme "Our Green Heritage" during 1973 was to draw the attention of the public to the importance of wood production in the economy of South Africa. Although nature conservation and forestry, when viewed superficially, have little to do with each other, the forester can rightly claim to be the first guardian of our green heritage. There are few countries in which the forester is exclusively concerned with wood production. The five generally accepted main uses of forests are wood production, water conservation, conservation of grazing and haunts for wild life and fish, and open-air recreation. In addition to other important tasks, therefore, the forester probably fulfils his most important function of nature conservation in respect of wild life and particularly plant growth, and he promotes the protection and conservation of our green heritage.

In an attempt to remedy the shortage of professional officers (forestry), the Department annually selects three students at the College for Foresters at Saasveld for further study at the University of Stellenbosch. These officials, who naturally have to qualify for admission to university, are permitted to pursue the four-year B.Sc. (Forestry) degree course while retaining the salaries which they receive as Pupil Foresters. Annual salary increments are granted provided that they make satisfactory progress in their studies. After completion of the degree course, officials are transferred to the Professional Division of the Public Service.

Apart from this scheme, a Pupil Forester, a serving Forester and even a member of the administrative personnel may apply to the Public Service Commission for a bursary (usually R1 000 per annum) in order to pursue the B.Sc. (Forestry) degree course at the University of Stellenbosch. The Department grants leave to successful applicants on the so-called 50:50 basis to cover the official's absence during his studies.

## 6. INSPECTOR : COMMERCIAL INSPECTIONS

### ASSIZER'S CERTIFICATE

Admission qualification: A Standard X Certificate with Mathematics as a subject.

Nature and duration of the course: The course extends over four years and consists of Parts A and B.

Part A extends over three years, i.e. one year of theoretical training offered by the colleges for advanced technical education at Durban, Cape Town, Pretoria and Johannesburg, and two years of practical in-service training in the Department of Commerce.

### Theoretical training (one year)

#### First trimester

Mathematics T1  
Applied Mechanics T1  
Principles of Electricity T1  
Engineering Drawing T1  
General Studies T1

#### Second trimester

Mathematics T2  
Principles of Electricity T2  
Applied Mechanics T2  
Electronics T2

Third trimester

Electronics T3  
Automatic Control T3  
Electronic Measurements T3  
Digital Techniques T3

After the theoretical training two years of practical in-service training follows.

Note: The completion of Part A qualifies a candidate for the National Certificate for Technicians.

Part B (theoretical training) is offered by the Department and extends over one year.

First semester

Weights and Measures Act  
Weights and Measures Regulations:  
Parts II to VI and Dairy Glassware  
Regulations  
Mensuration: Area and Volume  
Calculation  
Weights and Measures Regulations  
Part I

Second semester

Weighing and Measuring Practice  
(Theoretical)  
Weighing Practice (Practical)  
Measuring Practice (Practical)  
Applied Electronics

Further training: A limited number of selected candidates can also attend the course at colleges for advanced technical education which leads to the National Diploma for Technicians. The course extends over two years and consists of theoretical subjects only. The conditions for the training of engineering technicians are, however, applicable to this course as well. See p. 25.

Vocational service: Candidates must enter into an agreement with the Department of Commerce that they shall serve the Government for at least three years after completion of training.

Candidates interested should first apply to the Department at Pretoria for appointment as Pupil Inspectors: Commercial Inspections. Candidates with appropriate higher qualifications, such as a course at a college for advanced technical education which includes corresponding subjects, may be exempted from such parts of the theoretical first-year course.

On completion of the training programme, the student can act independently as Inspector: Commercial Inspections and utilize the opportunity as a young official to prove his ability at an early age.

The Division Commercial Inspections offers an attractive and interesting career to candidates with a technical background and aptitude who are interested in the composition and operation of a divergent variety of instruments which have to be inspected for accuracy and suitability for use in commerce and industry. These activities extend over the entire country, which is divided into regions for this purpose, with offices at Pretoria, Cape Town, Johannesburg, Durban, East London, Port Elizabeth, Bloemfontein, Kimberley, Klerksdorp, Vereeniging, Springs, Pietermaritzburg, Worcester and Windhoek.

Deserving candidates can advance to Senior Inspector, Chief Inspector and Control Inspector: Commercial Inspections. Persons occupying the last-mentioned posts, for example, are in charge of large numbers of personnel. See also p.6 for opportunities for advancement in the Public Service.

7. MERCHANT SHIPPING

(i) NAVIGATING CADETS AND MERCHANT NAVY NAVIGATING OFFICERS

South African Merchant Navy Academy General Botha

Admission qualification: The admission qualification to the course for navigating cadets is a minimum of Standard X Mathematics and Physical Science, although generally the complete Standard X Certificate is required. Candidates must also

present themselves for a personal interview and undergo a strict medical examination. All cadets are required to live on the premises of the Academy for the duration of the course.

#### Nature and duration of the courses

##### Cadet course

After completing approximately 12 months' sea service as employees of shipping companies, Navigating Cadets are entered by their employers at the Academy for a residential course of 20 weeks. Tuition is given in subjects such as Navigation, Mathematics, Physics, Meteorology, Ship Construction and Stability. In addition practical training in Seamanship and Boat handling is provided. At the end of this course Cadets return to sea for a further period of service.

A minimum total period of some 25 months must be served at sea before a Navigating Cadet is eligible to write the examination for a certificate of competency as Second Navigating Officer.

On completion of the qualifying sea service Cadets return to the Academy for a 20-week course which prepares them for their Second Navigating Officers' examination.

##### Officer courses

Serving Navigating Officers return to the Academy at various stages in their careers for intensive courses which enable them to write the examinations for certificates of competency as Master of a Coasting Vessel, Chief Navigating Officer and Master of a Foreign-Going ship.

Examinations for certificates of competency are conducted by the Marine Division of the Department of Transport.

Applications for training at the South African Merchant Navy Academy General Botha must be submitted by June in the year preceding the year of training. Applications must be addressed to the Captain Superintendent, S.A. Merchant Navy Academy General Botha, P.O. Box 2880, Cape Town 8000.

#### (ii) RADIO OPERATORS

A prospective Radio Operator must hold a Standard X Certificate so that he can take the course prescribed by the Postmaster-General, viz the National Certificate for Technicians (Telecommunication : Radio). (See p. 57 for particulars.)

##### Training centre

Cape College for Advanced Technical Education, Cape Town.

#### (iii) MARINE ENGINEERS

##### CERTIFICATE OF COMPETENCY AS SECOND ENGINEER-OFFICER

Admission qualifications: A candidate must be at least 21 years of age. He must prove that since reaching the age of 15 years he has served satisfactorily for not less than 4 years as apprentice engineer or journeyman on work suitable for the training of a marine engineer in the manufacture or maintenance of machinery.

After completion of the workshop service, he must complete at least 21 months' sea service before taking the examination for the above-mentioned certificate.

##### Examination subjects

###### Part A

Applied Mechanics  
Heat and Heat Engines  
Mathematics  
Drawing

###### Part B

Electrotechnology  
Elementary Naval Architecture  
Engineering Knowledge  
Oral

There are also alternative courses which may be taken, viz a university degree in Mechanical Engineering or a National Diploma course in Marine Engineering. See provisions for training in engineering and other industries which also refer to this diploma course, p.25.

## CERTIFICATE OF COMPETENCY AS CHIEF ENGINEER-OFFICER

Admission qualifications: A candidate must have passed the examinations for a Certificate of Competency as Second Engineer-Officer and have completed another 21 months' sea service before being admitted to the examinations.

### Examination subjects

#### Part A

Applied Mechanics  
Heat and Heat Engines

#### Part B

Electrotechnology  
Elementary Naval Architecture  
Engineering Knowledge  
Oral

### Training centres

Colleges for Advanced Technical Education: Cape Town, Durban.

## (iv) MARINE ENGINEERING CADETS (CADET ENGINEERING SCHEME)

### NATIONAL CERTIFICATE IN MARINE ENGINEERING

The Department of Transport has approved an alternative method of training Marine Engineers. Instead of starting as a trade apprentice, the trainee joins a company such as S.A. Marine Corporation Ltd. (Safmarine) as a Marine Engineering Cadet.

Admission qualifications: The minimum qualification is a Standard X Certificate with Mathematics and Physical Science.

Nature and duration of the course: The period of training extends over four years, as follows:

First year: At sea

Second year: Full-time study at a college for advanced technical education

Third year: Shore-based workshop training

Fourth year: At sea; in-service training

### Training centres

Colleges for Advanced Technical Education: Cape Town, Durban.

Vocational service: The part played by commercial shipping in international trade and consequently in the economic welfare and progress of a country cannot be over-estimated. South Africa also has a growing commercial fleet in which a number of shipping companies have interests. They have to control a great volume of marine transport for the country. Careers for young South Africans in the service of one of these companies, of which Safmarine is the largest, are for example the following:

Navigating officers: These are the men who are responsible for steering a ship. On the successful completion of various examinations and the attainment of a considerable amount of experience, one can advance to the rank of ship's captain or master of a ship.

Marine engineers: These men are in control of the nerve centre of the ship, the machine room. Success in various examinations and adequate experience are provisos for consideration for promotion to the highest rank, viz chief engineer.

Cadet marine engineers: Their field is the same as that of the marine engineers and they can also advance to the rank of chief engineer, but their training programme differs from the above-mentioned one.

Electricians: They also work in the machine room and their field is thus a subdivision of the engineering division. They are trained artisans and can advance to senior electricians.

Provisions officers: These persons are responsible for providing everyone on

board with food and caring for their general welfare. They can advance to chief stewards.

Radio operators: These persons keep contact with the outside world and are the eyes and ears of the ship. Navigating officers and marine engineers rely to a very great extent on the reports of radio operators, among other things to ensure safety on board.

As in the case of many other careers, a career at sea has its advantages and disadvantages. However, a career in the merchant navy is altogether worth while for those who like this kind of life and work, who can acquire the necessary qualifications and are prepared, through hard work sometimes accompanied by personal sacrifice to embark on the road of promotion leading to the high posts.

## 8. PATENT AGENT'S EXAMINATION

Admission qualifications: To be eligible for admission to any course for the examination a candidate must be in possession of a Matriculation Certificate of the Joint Matriculation Board or a certificate of full exemption issued by that Board or of a degree conferred by a university recognized for the purpose by the Board for the Recognition of Examinations in Law.

Nature and duration of the course: The duration of the course is at least four years, provided that the Board may, at its discretion, when granting exemption from one or more of the prescribed subjects, determine the period during which a candidate will be permitted to complete the course.

The course must be completed in the following manner:

### First year

Physics  
Chemistry  
Mercantile Law  
Mechanical Engineering Drawing and Design

### Second year

Patent Law and Practice of the Republic, including case law of the Republic and the United Kingdom  
Trade Mark Law and Practice of the Republic, including case law of the Republic and the United Kingdom  
Designs and Copyright Law and Practice of the Republic, including case law of the Republic and the United Kingdom  
Interpretation of Statutes

### Third year

Law of Procedure (Supreme Court)  
Comparative Study of Patent Law (United Kingdom, United States of America, France and Germany)  
Comparative Study of Trade Mark Law (United Kingdom, United States of America, France and Germany)  
Manufacturing and Industrial Processes and Machines

### Fourth year

Drafting of Specifications and Agreements  
Interpretation and Criticism of Specifications  
Patent Agent's Practice

The Board may grant exemption from any subject to a candidate who has passed some other examination in such subject deemed by it to be equivalent to its own examination; provided that no exemption shall be granted in respect of the subjects prescribed for the fourth year of the course.

### Training centre

There is no institution which specifically provides training for the Patent Agent's

Examination. Subjects such as Mercantile Law, Interpretation of Statutes and Law of Procedure may be taken by means of a correspondence course through the University of South Africa.

Physics, Chemistry and Mechanical Engineering Drawing and Design may be taken at a technical college or other suitable institution. A first-year university course in these subjects is recommended.

Further information may be obtained from the Secretary of the South African Institute of Patent Agents. The present address of the Secretary is: Mr T.D. Burrell, c/o Spoor and Fisher, P.O. Box 454, Pretoria 0001.

N.B.: The address of the Secretary changes from time to time.

Vocational service: The Patent Agent's Examination is controlled by the Department of National Education in co-operation with the Board for the Recognition of Examinations in Law. The course is comprehensive and candidates who wish to tackle it directly after passing Standard Ten will have to be prepared to work very hard.

In practice, patent agents must be qualified to handle matters such as, for example, whether a patent can be obtained in the Republic in the case of alleged inventions which are submitted to them; the filing and handling of patent applications; amendment of patent specifications; enforcement of patents against infringers; maintenance of patents and so forth.

Qualified persons usually work in divisions of firms (usually firms of attorneys) which act as patent agents. The Department of Commerce also employs them for work in the patents office.

## 9. POLICE

DEPARTMENT OF THE SOUTH AFRICAN POLICE

- (i) BASIC TRAINING OF CONSTABLES
- (ii) COURSES FOR PROMOTION
- (iii) DETECTIVE PROBATIONERS' COURSE
- (iv) OTHER TRAINING AND TRAINING CENTRES

### (i) BASIC TRAINING OF CONSTABLES

#### Admission qualifications

Male persons: White male persons who are South African citizens, not less than 16 and under 35 years of age, at least 1,68 metres in height without shoes and with a chest measurement of not less than 86,36 cm, free from mental and physical disabilities, with a strong constitution suitable for police work, tender proof of good character, are in possession of at least a Std VIII Certificate and are bilingual, may join the South African Police.

Women in the Police Service: Applicants must be in possession of at least a Std X Certificate; be mentally and physically suitable; have passed the departmental test and appear before a selection board. They must be not less than 18 and not more than 36 years of age at the time of appointment, at least 1,65 metres in height, unmarried, bilingual, South African citizens and be prepared to serve in any branch of the Force and at any place in the country.

Nature and duration of the course: The training includes classroom instruction, practical training in musketry, self-defence, first aid, drill and other facets in order to develop the student into a full-fledged constable in the South African Police. The period of training of candidates with a Std X or equivalent certificate or with a degree is five months. For students who do not possess a Std X Certificate, the training period is 10 months. Thereafter the training is completed by means of practical man-to-man training at the Constable's division

and thereafter at his station or post. The duration of this training depends on the nature of the work and the branch in which the member serves.

#### Subjects

Force Administration	Afrikaans and English
Investigation of Crime	Criminology and Ethnology
South African Criminal Law	First Aid
Criminal Procedure	Self defence
Statute Law	Musketry
Law of Evidence	Anti-riot Training
Police Science	Drill exercises

#### Training centre

South African Police College, Pretoria.

### (ii) COURSES FOR PROMOTION

Note: Constables can be promoted through all the military ranks from Sergeant up to and including General. Examinations are written up to and including the rank of Lieutenant. Courses are, however, not held for all ranks.

Admission qualifications: A Constable must complete two years' service in order to qualify for participation in an examination for promotion to the rank of Sergeant (three years if he does not possess a Std X Certificate), two years' service in the rank of Sergeant in order to qualify for participation in an examination for promotion to rank of Warrant-officer and one year's service in that rank in order to qualify for participation in an examination for promotion to the rank of Lieutenant. A policeman who has obtained a suitable degree or diploma may be considered for promotion without writing the departmental promotion examinations on the following basis:

He must serve the same qualifying periods in the various ranks as mentioned above. To be considered for promotion to the rank of Sergeant he must have successfully completed four subjects or the first year of his degree or diploma, depending on the number of subjects prescribed for the first year by the university or college and be at least 20 years of age; for promotion to the rank of Warrant-officer he must have completed eight subjects or the second year, and to be promoted Lieutenant he must obtain the full degree or diploma. The degree B.A. (Pol.), the Police Diploma and the degree B.Juris are, amongst others, suitable degrees.

Nature and duration of the courses: The courses are theoretical and practical and are intended to prepare policemen for future responsibilities as Commanders and simultaneously to serve as selection courses. The duration of these courses vary from three weeks to three months and are at present presented to members being considered for promotion to the ranks of Sergeant, Lieutenant and Major.

#### Subjects

Commanding Techniques	Crowd Control
Control of Personnel	Financing
Personnel Administration	Provision of Stores
Force Administration	Particular aspects of Law
Background Knowledge	Police Science
Crime Prevention and Control	Criminology

#### Training centre

The In-service Training Unit of South African Police at the S.A. Police College, Pretoria.

### (iii) DETECTIVE PROBATIONERS' COURSE

Admission qualifications: To qualify for the course, members must have at least two years' service, show the necessary interest and aptitude and be recommended by their Commanders.

Nature and duration of the course: The course is practical and theoretical, is of six weeks' duration and serves to prepare the policeman as a detective. After completion of the course he receives man-to-man training for a period of twelve months, after which period he is appointed as detective, provided he is successful in his work.

Subjects

Investigation of Crime	Background Training
Statute Law	Criminology
South African Criminal Law	Police Science
Law of Criminal Procedure	Force Administration

Training centre

The In-service Training Unit of the South African Police, at the S.A. Police College, Pretoria.

(iv) OTHER TRAINING AND TRAINING CENTRES

The Department provides a wide variety of training in other facets of operations in which the police are involved or which are necessary in order to ensure that the Department will be able to fulfil its functions effectively. These courses vary in duration from periods of one week to six months and are both theoretical and practical. All members of the Force qualify for these courses which, with few exceptions, are all provided by the Department itself. Financial aid is provided in that all members, while on course, are entitled to their full salaries, free board and lodging is normally provided and travelling and subsistence allowances are paid where applicable.

The following may serve as examples:

Organisers of Training	Counter-insurgent training
Registration Clerks	State security
Bandsmen	Commercial Branch
Radio technicians	Prosecutors
District Motor mechanics	Instructors
Builders	Members of the S.A. Narcotic Bureau (SANAB)
Farriers	Caterers
Storemen	
Mess, Canteen and Sports Club Secretaries	

The South African Police also have the following training centres at their disposal:

(i) The S.A. Police School for Mechanical Training at Benoni, where police drivers are trained in the maintenance and driving of police vehicles. The course is theoretical and practical and is of six to eight weeks' duration. Motor mechanics receive six months' technical training in order to qualify as tradesmen.

(ii) The S.A. Police Dog School in Pretoria, where police dogs and dogmasters are trained. The course for dogmasters lasts for seven months, of which four months are spent at the dog school and the remaining three months at a station. Patrol dog handlers receive training for between three and four months. Courses for dogs and their handlers who specialize in the tracing of drugs are of four months' duration.

(iii) The S.A. Criminal Bureau at Pretoria, where training is provided for experts in the identification of fingerprints, photography in criminal cases, examination of disputed documents and the identification of handwriting, firearms and projectiles.

(iv) The S.A. Police Forensic Scientific Laboratory at Pretoria, where practical training is provided in the field of forensic science for selected applicants who are in possession of at least a B.Sc. degree. The training covers a period of approximately 18 months.



Vocational service: The South African Police is a semi-military organization consisting of the uniformed, detective and security branches and is responsible for the security of the State, maintenance of law and order and the prevention and investigation of crime in the Republic of South Africa and South-West Africa in accordance with section 5 of Act 7 of 1958: Police Act. The aim is that each section of the community shall, as far as possible, be served by its own people in compliance with traditional policy. For this reason training centres also exist to provide the same basic training for the Bantu, Coloureds and Indians.

Possibilities for promotion for ambitious men and women are virtually unlimited. Promotion to higher ranks mainly occurs on the successful completion of internal examinations. However, promotion is accelerated if a candidate is already in possession of an appropriate degree or diploma or has had recognized previous experience. Newcomers to the Force receive full salary during their training. From this they pay a minimum amount for board and lodging. Uniforms and other equipment necessary for training purposes are supplied free of charge. During training courses, members of the Force are entitled to their full salaries. Where applicable, lodging and meals are supplied by the Department and travelling and subsistence allowances are paid.

The South African Police provides a number of bursaries to serving members of the Force who intend to qualify themselves academically in a suitable direction and in some cases class fees are repaid to successful candidates.

#### 10. PRISON OFFICER

DEPARTMENT OF PRISONS

Training College, John Vorster, Kroonstad, OFS

Admission qualifications: A candidate must be a citizen of the Republic of South Africa and be not less than 16 years of age; males must be not less than 1,68 metres in height, measured without shoes; be free from any mental and/or physical defect and of strong constitution; furnish proof of good character; and have passed at least Standard VIII or an equivalent examination.

Nature and duration of the basic training course: Candidates receive basic training at the training college at Kroonstad. The course extends over approximately five months during which lectures are given on the Prisons Act and Regulations, foot and rifle drill, markmanship, civil defence and other aspects related to the duties of the Department such as military etiquette, personnel administration, prison administration, stores administration, accounts, internal relations, public relations, spiritual preparedness, court procedure, practical language, self-development and drug addiction.

After completion of the training period, probationary warders and wardresses participate in a magnificent passing-out parade and are then transferred to the various prisons.

Personnel development

- (i) Functional training: It is essential that all personnel members should be continually subjected to training programmes after their basic training and that they should have the opportunity for self-development. Consequently they are, after a process of selection, given the opportunity to attend conferences and symposiums and the following courses offered by the Department or other institutions:

Prosecutors	Training Officers (combined with supervision)
Presiding Officers	Boiler Attendants
Additional Fire-arm training	Nursing Staff
Dog Handlers	Stores Administration
Instructors	Work Study
Candidate Officers	

Apart from the above-mentioned Departmental courses, members are continually encouraged to improve their qualifications.

- (ii) Training of women: Women who are interested in the Prison Service as a career must comply with the same requirements for appointment as men, but must be at least 18 years old and have a minimum height of at least 1,6 metres without shoes. However, they are trained in smaller groups and only periodically, according to requirements. The course is not so comprehensive, is of shorter duration and is offered at Kroonstad. Women, just like men, share in all available privileges.
- (iii) In-service training: All members are subjected to organized, practical training in the work situation. This training is given at all prisons and includes a continuous training programme of man-to-man instruction.

Technical training: Selected members can also qualify as artisans in the Department. During their period of training the apprentices receive the same salary as that applicable to warders with the same qualifications.

Bursaries and loans: The Department makes a limited number of bursaries annually available to selected members to enable them to qualify in certain studies on a full or part-time basis. The Prison Service Benefit Fund also makes interest-free study loans available to members of the Department, to enable them to better their appropriate academic qualifications on a part-time basis.

Vocational service:

Besides the safe custody of prisoners, it is also the task of the Department to apply such treatment to convicted prisoners as may lead to their reformation and rehabilitation. In addition to control and administrative work, sections exist in the Prisons Department such as Technical, Building, Agricultural, Refreshment and Hospital Divisions as well as specialized treatment services such as Psychological Services, Educational Services and Social Work and a section for Spiritual Care.

The Department provides ample opportunities for promotion to any man or woman who possesses the necessary potential, perseverance and diligence to reach the highest position in any section of the Prisons Department.

11. PROVINCIAL INSPECTOR/TRAFFIC OFFICER

Admission qualification: The minimum requirement is a Standard VIII Certificate but candidates with a Standard X qualification receive preference. Candidates are tested on a scientific basis beforehand. The minimum age is 18 years.

Nature and duration of the course: Provincial inspectors and traffic officers are trained by each province. Training occurs in co-operation with the larger local authorities. There is consequently no uniform training at national level, although steps are being taken in this direction.

As an example, the new uniform diploma course of the Transvaal Provincial Administration is discussed briefly below:

At present only those persons in possession of the Provincial Diploma may be appointed as traffic officers. This holds good for appointments by the province and all local authorities.

The course for the Diploma is of three months' duration at one of the training centres for traffic officers in Pretoria (2), Johannesburg and Potchefstroom.

Prospective traffic officers receive theoretical and practical training in sections such as self-defence, pistol shooting, techniques of arrest, court procedure, administration, application of the law, etc.

The examining body is the Institute of Traffic Officers of Southern Africa, which acts in co-operation with the Provincial Administration.

Further training: If any traffic officer wishes to be considered for promotion, he has to be in possession of a Standard X Certificate. After two years' experience a traffic officer can write the Preliminary Examination, after a further year the Intermediate Examination and after yet another year the Final Examination for the Diploma of the Institute. However, training at one of the recognized training schools (also at Cape Town and Durban) results in exemption from the Preliminary Examination and a candidate can enrol directly for the Intermediate Examination after three years' training.

Further particulars of these three examinations can be obtained from the Secretary, Institute of Traffic Officers of Southern Africa, P.O. Box 113, Potchefstroom 2520.

Vocational service: Although their training and duties are generally the same, a distinction is made between traffic officers in the service of municipalities and those in the service of a province. The first group of officers perform a variety of duties within the boundaries of a municipality. The duties of officers in the service of a province are somewhat different and also differ from province to province. In the Provincial Administrations of the Transvaal and the Orange Free State, the duties of a provincial inspector and traffic officer are combined. It is their duty to apply various ordinances aimed at safeguarding the travelling public, to protect the public from malpractices, particularly in commerce, and to combat various other evils. Generally speaking, they are involved in road traffic and inspection services.

In the Provincial Administrations of the Cape and Natal a distinction is made between the duties of a traffic officer and those of a provincial inspector. The traffic officers mainly perform duties in connection with road traffic, while the inspectors are more or less involved in inspection services.

Officers in the service of one of the provincial administrations share the usual privileges of public servants and promotion occurs according to merit. The normal line of promotion for provincial inspectors is Senior, First and Chief Provincial Inspector and that for traffic officers Senior, First, Chief and Control Traffic Officer. These posts are within reach of any young man with ambition and perseverance.

The Institute of Traffic Officers of Southern Africa also makes bursaries available to traffic officers who are in the service of approved traffic divisions. Enquiries should be directed to the Institute.

## 12. SOUTH AFRICAN DEFENCE FORCE

### OFFICERS, MEN (OTHER RANKS) AND WOMEN IN THE PERMANENT FORCE

The task of the Permanent Force can be divided into two main functions, i.e. the line (combat) function, and the staff function (administrative and technical). These functions are carried out by various sections within the Army, Air Force and Navy, by General Service Officers (fighting element), Technical and Administrative Officers, Professional Officers, as well as artisans, operatives and non-technical other ranks.

#### (1) PROFESSIONAL OFFICERS IN THE PERMANENT FORCE

(Direct officer training for men, excluding training leading to a degree in Military Science.)

(a) S.A. ARMY

(i) General Service, Technical and Administrative Officers

Admission qualifications: A Standard X Certificate, preferably with Mathematics as a subject. Candidates must be White male bilingual citizens of the RSA or SWA and medically fit. They must be not younger than 17 and not older than 23 years at the beginning of the course.

Nature and duration of the course: Training may coincide with National Service, and normally begins in January and July every year. It can be divided into:

Basic training	: 9 weeks
Junior leader training	: 13 weeks
Corps training	: about 24 weeks (continues until the end of the first year)
Unit training	: 40 weeks (January intake) or 14 weeks (July intake)
Young officers' course	: 2 phases of 12 weeks each

Following this, candidates may be selected to take a degree course in Military Science in a B.A., B. Com. or B.Sc. direction.

(ii) Technical Officers

Serving qualified artisans possessing at least an N3 certificate with English and Afrikaans at Standard X level, may be trained as Technical Officers.

(iii) Technical Munitions Officers

Admission qualifications: Candidates must meet requirements similar to those applicable to General Service, Technical and Administrative Officers, but must also have passed in Mathematics and Science at Standard X level, and must not be older than 30.

Nature and duration of the course: Candidates follow the four years' sandwich course for the National Diploma in Munition at the Pretoria College for Advanced Technical Education. (Particulars of the course appear on p.46 ) The training includes basic officers' training (six months) and various munitions, explosives and weapons courses. Practical work is done at test ranges, ammunition depots and factories.

All successful candidates become candidate officers. On completion of the first year's training, successful candidates attain the rank of Second Lieutenant. This is followed by promotion to the rank of Lieutenant after another two years' training. Upon completion of the fourth year's training, successful candidates are classified as professional officers.

(b) S.A. AIR FORCE

(i) Pilots and Navigators

Admission qualifications: Only persons in the following categories will be considered for training:

Permanent Force Members  
Persons who have completed National Service  
Persons undergoing National Service.

Candidates must also

- be single, White, male bilingual citizens of the RSA;
- at commencement of the course be 17 years old but not older than 25;
- be medically fit;
- be in possession of a Standard X Certificate or an equivalent with English, Afrikaans and Mathematics as subjects, or a Standard X Certificate (Matriculation Exemption) for the degree of B. Mil.;
- enter into an agreement with the State, assisted by parents or guardian in the case of minors, to serve in the SA Air Force for not less than 10 years in one of four categories, upon successful completion of training.

Nature and duration of the course: The training of pilots in the SA Air Force takes place annually during two courses which commence in January and July respectively, and which consist of the stages as set out below:

Orientation phase: All candidates for training as pilots and navigators attend this phase, which lasts for three months. Selection of candidates takes place during this phase and those chosen attest as Candidate Officers in the Permanent Force.

Flying Training (Pilots): Apart from flying training, this phase also includes training in navigation, aerodynamics, meteorology, flying as well as a course in altitude physiology and the technical aspects of the aircraft which he is to fly. Training lasts 15 months and commences with Harvards at Dunnottar, followed by Impalas at Langebaan Road. Candidates who are successful, receive their wings on completion of this phase.

Navigation training: Navigators are trained over a period of 15 months at the Air Navigation School at Ysterplaat in Cape Town. During this period the candidate officer is taught subjects such as Mathematics, Astronomy, Meteorology, Electronics, charts and plot charts, Magnetism, the theory of navigation, as well as practical navigation training.

Formative training: Candidates are eventually appointed as officers in the South African Air Force. During the formative training period the emphasis is on leadership and character building. Training is given at the SA Air Force College, Pretoria, and lasts three months.

Practical experience: Following the period of formative training, candidate officers receive three months' practical training at squadrons. On completion of this period, candidate officers are appointed Permanent Force officers, with the rank of Second Lieutenant.

Advanced scientific formative training: Only candidates eligible for university admission who are specially selected during their period of formative training, take part in this course. Training lasts 24 months and is also conducted at the Military Academy (Faculty of Military Science of the University of Stellenbosch). On successful completion of the course, candidate officers (pilots and navigators) receive a Bachelor's degree in Military Science (B.Mil.).

(ii) Flight Controllers (Air Traffic Controllers, Fighter Controllers and Missile Controllers)

Admission qualifications: Candidates (men as well as women) must possess a Standard X Certificate or equivalent with English and Afrikaans as subjects. They must have passed Mathematics at least at the Standard VIII level. They must not be older than 30 years and be of good character, medically fit, bilingual and without any speech impediment and must be citizens of the RSA. Military and/or civil flying experience will be a recommendation. Candidates must be approved by an Officer Selection Board.

Nature and duration of the course

(a) Air Traffic Controllers

A Basic radar operators' course of six weeks at the Air Defence School in Pretoria  
Air traffic control (theory) for 12 weeks at Pietersburg  
Air traffic control (practical) at various Air Force units for 12 months  
Ground control (radar) at Pietersburg for 12 weeks  
Officer orientation for 12 weeks at the S.A. Air Force College in Pretoria.

(b) Fighter Controllers

Basic radar operators' course for six weeks at Air Defence School in Pretoria  
Basic 33-week fighter control course at Air Defence School in Pretoria  
Practical fighter-control/Air Defence Systems for 12 months at static or mobile radar units  
Officer orientation for 12 weeks at S.A. Air Force College in Pretoria.

(c) Missile Controllers

Specialist training for 21 months. Officer orientation for 12 weeks at S.A. Air Force College in Pretoria.

(iii) Technical Officers

Serving qualified artisans with at least four years' service and possessing an N3 certificate with English and Afrikaans as subjects, may be appointed as technical officers, subject to a successful completion of a three-month officers' orientation course at the S.A. Air Force College, and a specialized course in technical administration.

(iv) Equipment Officers

Direct appointment: Serving members in the ranks with a Standard X Certificate

or equivalent with English and Afrikaans as subjects as well as four years' experience in the equipment branch of the S.A. Air Force, may be appointed as equipment officers after successful completion of an officers' orientation course (three months) as well as a three-month specialized course in equipment at the S.A. Air Force College.

Task register training: After completion of three months' basic training, candidates with English and Afrikaans at Standard X level undergo a 21-month course in task register training on equipment or administration, which is given at various Air Force units. This includes a three-month officers' orientation course at the S.A. Air Force College.

(v) Administrative Officers

Direct appointment: Serving members possessing at least a Standard X Certificate or equivalent with English and Afrikaans as subjects, and four years' experience in the administrative branch of the S.A. Air Force, may be appointed as administrative officers. Appointment follows upon successful completion of a three-month officers' orientation course, as well as a three-month specialized administrative course at the S.A. Air Force College.

(vi) Operation/Information Officers

Candidates who possess a Standard X Certificate, who are single and not older than 25 years, receive three months' basic training, which may coincide with National Service, followed by a six-week Basic Operation/Information course at the S.A. Air Force College. This is followed by a ten-week Advanced Operation/Information course before candidates undergo 21 months' Specialist Operation/Information training at various Air Force units. Then follows a three-month officers' orientation course at the S.A. Air Force College.

(c) S.A. NAVY

Training of Engineer Officers, Executive Officers and Stores or Administrative Officers

Admission qualifications: Candidates should be in possession of a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). Mathematics is required for training as an executive officer. Candidates should furthermore be White male citizens of the RSA, bilingual, not younger than 18 but not older than 25 years. They must be single and medically fit for appointment as Midshipmen and, in the case of minors, have the parent or guardian's consent to undergo training.

Nature and duration of the course: Candidates meeting these requirements may apply before 20 December each year. At the end of January, once examination results are known, candidates are brought to Simonstown at Government expense to undergo medical examinations and sit for aptitude tests. After this candidates appear before a Selection Board, and those who are successful are appointed as Midshipmen during February (Permanent Force, S.A. Navy). This is followed by 12 months' training at the S.A. Naval College, Gordon's Bay.

Training may be divided into three phases:

- Phase I : Thirteen months, including 3 months' basic Naval training and training at sea
- Phase II : Officer orientation for 6 months
- Phase III : Academic training (optional)
- Phase IV : Unit training.

Candidates who receive direct training follow the same course, until completion of Phase II, as that followed by the B.Mil. candidates. At this stage the direct training group and the B.Mil. candidates are split and appointed as Ensigns at the end of their second year. This group continues with Phase IV.

Phase IV entails practical training at units and continues until the end of the

fourth year. On completion of this phase, Ensigns are appointed as Sub-lieutenants.

## (2) TRAINING OF PROGRAMMERS

Admission qualifications: Candidates, men as well as women, must be White, bilingual citizens of the RSA, be medically fit and hold a Standard X Certificate with Mathematics, pass an aptitude test for programmers and be recommended by an Officer Selection Board, and be younger than 30 although no experience is required.

Nature and duration of the course: Chosen candidates receive 12 to 13 weeks' orientation in:

Principles of the computer; Introduction to 360/370 computers; Cobol (theory and practical); Job control language; Principles of informal management systems; Introduction to DL/1.

This training also includes officer orientation, and is followed by in-service training. After two years' in-service training successful candidates are appointed lieutenants.

## (3) TRAINING FOR MEDICAL AND DENTAL SERVICES

Note: Although this training can only be given at a university, it is briefly mentioned here in order to present a complete picture of the training offered by the S.A. Defence Force.

Admission qualifications: A Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with Mathematics and Physical Science as subjects. Candidates must be single, White, male bilingual citizens of the RSA. They must be medically fit, accepted as students by the University of Pretoria and be recommended by an Officer Selection Board.

Training: Candidates study full-time while receiving full salaries. They are, however, responsible for their registration, class and examination fees. Students are required to reside in the Officers' Club at the S.A. Medical Service Training Centre and must attend classes in uniform.

## (4) MEN (OTHER RANKS) IN THE PERMANENT FORCE

### (i) Apprentices

Admission qualifications: Candidates must be bilingual, White, unmarried male citizens of the RSA; medically fit with at least a Standard VIII Certificate with Mathematics as a subject; between 16 and 25 years old and display an interest in technical matters, and in possession of their parents' or guardians' written consent to undergo training if they are still minors.

Training: Many apprentices are employed annually in one of about 80 trades currently available, in order to do their apprenticeship of at least 3 years. Technical education is given in conjunction with apprenticeship training. These courses are conducted by the S.A. Defence Force and Technical Colleges, in Pretoria (Army and Air Force candidates) and Cape Town (mainly for Naval apprentices).

There are also numerous opportunities for qualified tradesmen with the required educational and technical qualifications (at least N3 with English and Afrikaans at the Standard X level) to become officers.

### (ii) Operatives

Admission qualifications: Candidates must be White, male bilingual citizens of the RSA; medically fit with a Standard VIII Certificate (preferably with Mathematics); between 18 and 30 years of age, and have their parents' or guardians' consent if they are still minors.

Training: Operatives such as radar operators, telecommunications operators, chefs, musicians, firemen, etc. are trained by various units within the S.A. Defence Force. Training lasts about four years.

(iii) Non-technical members (other ranks)

Admission qualifications: Candidates must be White, male bilingual citizens of the RSA; medically fit, with a Standard VIII Certificate (but preferably a Standard X Certificate). Minors must have their parents' or guardians' consent.

Training: Apart from basic training, the S.A. Defence Force has a broad and intensive training programme aimed at a constant improvement in personnel skills. Periodical courses with a view to promotion offer the opportunity for advancement to the highest levels.

(5) WOMEN IN THE PERMANENT FORCE

The role of women in the Permanent Force cannot be stressed too strongly. In order to release men for operational duty, women are trained and utilized to an increasing extent as non-technical members, operatives (radar and telecommunications operators and learner caterers) and in the case of the S.A. Army, as apprentices in the electronic trades.

Admission qualifications: Candidates must be

- White, bilingual and citizens of the RSA;
- between 18 and 49 years old, or 16 to 25 (apprentices) or 16 to 30 (learner operatives);
- in possession of at least a Standard VIII Certificate (but preferably a Standard X Certificate; Mathematics is required for an apprenticeship );
- medically fit and be recommended by a selection board;
- minors must have their parents' or guardians' consent.

Training

(i) S.A. Army and Air Force

Women receive in-service training and go on regular promotion courses like men.

(ii) S.A. Navy

Women in the Navy are trained mainly as tactical data operators and telecommunications operators. Six weeks' basic training at Saldanha is followed by specialist training.

(a) Tactical data operators: A basic three-week tactical data operators' course at Tactics School, Simonstown, follows immediately after basic training. This is followed by further basic training at Tactics School, Silver Mine, and Maritime Headquarters, Simonstown.

(b) Telecommunications operators: Following six weeks' basic training at Saldanha, candidates are sent to the School of Signals in Simonstown for further training. Telecommunications personnel are especially selected for their integrity and special aptitude for the job.

(iii) Officer training for women

Women who display special aptitude may be trained as administrative and equipment officers. However, they are not considered for academic training.

(iv) Women in the medical service

Nursing in the S.A. Defence Force offers the student a golden opportunity not only to qualify as a nurse or nursing officer, but to pursue a vocation which demands complete maturity. It is a vocation which offers complete satisfaction, since the nurse in the S.A. Defence Force has a unique task in her involvement with patients. In addition, she renders an indispensable service without which a modern defence



force would be unable to function - a dedicated service to her country.

Admission qualifications: Candidates must be in possession of an educational qualification; be at least 16 but not older than 49 years, be medically fit, bilingual citizens of the RSA; be of good character, interested in the promotion of health in general and be found acceptable by an Officer Selection Board.

#### Training

(a) Registration as a general nurse:

The student nurse is attested as a candidate officer in the Permanent Force and must possess a Standard X Certificate and at least one science subject. The course lasts three years, and examinations are written at 1 Military Hospital, in conjunction with the South African Nursing Council. The curriculum entails :

Three weeks' military orientation, followed by registration as student nurse with the S.A. Nursing Council; Basic science; Biological science and Nursing.

Candidates wishing to qualify as midwives have to take an additional 12 months' course.

(b) Pupil (Staff) nurses: These girls are attested as pupil nurses, and they must be in possession of a Standard VIII Certificate. Candidates must be at least 16 years of age. The course lasts two years, and is held at 1 Military Hospital, in conjunction with the S.A. Medical Service Training Centre, Voortrekkerhoogte. The curriculum is more practical and entails:

Elementary Hygiene and Microbiology; Elementary Anatomy and Physiology; First aid; Science of Nutrition and Art of Cooking; Elementary theory and practice of nursing and family planning.

Successful candidates are registered with the South African Nursing Council.

(c) Pupil nursing assistants: The candidate is attested as a pupil nursing assistant, and must be at least 16 years old, with at least a Std VII Certificate. This course is held at the three military hospitals and four sick-bays.

In terms of the regulations of the S.A. Nursing Council, at least 100 theoretical periods as well as 6 months' in-service training are required.

Pupil nursing assistants receive theoretical training in elementary Anatomy and Physiology, Hygiene and the basic principles of nursing.

Examinations are both practical and oral. Successful candidates are registered with the Nursing Council and may nurse anywhere in the Republic of South Africa.

(v) Training of women for techniques in civil defence

The aim of the training of young women in the techniques of civil defence at the Civil Defence College, George, is not to offer them a permanent career in this field. Although the course provides for certain basic military training, mainly parade ground work, the aim is by no means to train women as soldiers. The emphasis in the training is placed on the moulding of leaders for states of emergency with due allowance for and the preservation of femininity.

Women who are interested, are in possession of a Standard X Certificate and are under the age of 22 years, can obtain more particulars from: Chief of the Army, Private Bag X172, Pretoria 0001.

Vocational service: The Permanent Force is constantly expanding in order to keep pace with the demands imposed upon it. This naturally involves more job opportunities and better prospects of promotion. There are excellent training facilities but each person must still rely on his own ability and capacity for work if he wishes to make rapid progress. The advantages of a career in the Force can be compared with the best.

There is no expense involved in military courses. Courses and study material are free of charge. Members who have to travel, receive subsistence and travel allowances.

13. SOUTH AFRICAN RAILWAYS

Admission qualifications

Clerks: A Standard VIII Certificate at least is required; Standard X pupils receive preference.

Pupil draughtsmen: Candidates must be South African citizens, under 22 years of age and in possession of a Standard X or equivalent certificate with Mathematics as a pass subject.

The training period extends over three years during which time they are afforded the opportunity to study full-time or part-time at a technical college or a college for advanced technical education towards the National Certificate for Technicians. Pupils receive their full salary during practical and theoretical training and tuition and examination fees are refunded to successful students. See course on p.19.

Pupil engineering assistants: Candidates must be South African citizens, under 23 years of age and in possession of a Standard X or equivalent certificate with Mathematics and Physics as pass subjects (or Physical Science or equivalent subject instead of Physics).

The training period (sandwich course) extends over 4 years during which time they are required to study full-time for approximately 18 weeks per annum at a college for advanced technical education towards the National Diploma for Technicians (24 subjects). See provisions for the training in engineering, p. 25.

Pupils receive their full salary during practical and theoretical training, and tuition and examination fees are paid by the Department.

Health Inspectors: Candidates must have a Senior or equivalent certificate with at least one science subject. They are employed as field assistants (health services) and receive three years' full-time training at the expense of the Department at a college for advanced technical education to enable them to obtain the National Diploma in Public Health. See course on p.127.

Apprentices: Candidates must have at least a Standard VII Certificate. The training period is four years, but an apprentice can, depending upon the technical qualifications which he obtained prior to or during his apprenticeship, take a voluntary qualifying trade test after  $3\frac{1}{2}$ , or 3 or  $2\frac{1}{2}$  years' practical training. If he passes he is appointed as technician and receives the salary of a technician.

Apprentices attend technical classes at technical colleges and colleges for advanced technical education throughout the Republic once per annum in the Department's time. Those who are in possession of higher educational/technical qualifications on engagement, can study up to the level of the National Certificate for Technicians in the Department's time. An apprentice who obtains this qualification, can be considered for appointment as draughtsman after completion of his apprenticeship.

Railway College Esselen Park: At the Railway College, Esselen Park, and at the six branches of the College, young men are trained as checkers, conductors, constables, drivers of diesel, electric and steam locomotives, firemen, guards, platelayers, shunters, station foremen, etc. Junior clerks and certain station foremen receive training in station accounts.

Advanced and specialized training, particularly in the technological field, is also given at the Railway College, as well as courses of a functional nature for which expensive apparatus had to be installed. The majority of the courses last  $2\frac{1}{2}$  months.

The Railway College, Esselen Park, has branches in Cape Town, Port Elizabeth, Bloemfontein, Durban, Johannesburg and Pretoria.

Vocational service: The South African Railways is the largest transport organization in the country. In addition to railway traffic, it controls the road transport services, the South African Harbours, the South African Airways and the pipelines. It is responsible for the transport of goods and passengers to the advantage of the public and the welfare of the country as a whole. The maintenance and effective functioning of this transport network require the services of competent and highly trained personnel such as engineers, technicians, administrative officers and thousands of others.

The Railways consequently offers a wide variety of interesting careers – a position for anyone who is worthy of his salt – with excellent prospects, fringe benefits and adequate remuneration for service. Ample provision, in the form of bursaries, is made for candidates who wish to further their studies.

The S.A. Railways has published a comprehensive guide on the large variety of careers in the railways, airways and harbours. More particulars on a career in one of the branches of the Railways can be obtained from the General Manager, S.A. Railways, Room 1214, Paul Kruger Building, Wolmarans Street, Johannesburg 2001, or from the nearest station master.

14. SUID-AFRIKAANSE TAALBOND

THE SENIOR AND THE JUNIOR EXAMINATION IN BILINGUALISM

The S.A. Taalbond annually conducts two examinations in Bilingualism, viz The Senior Examination in Bilingualism and The Junior Examination in Bilingualism.

The Senior Examination in Bilingualism

The standard of this examination is approximately equal to that of the two official languages on the Higher or A Grade for the Matriculation or Senior Certificate Examination.

Although it is expected that mainly Standard X candidates will be interested in this examination, any person, regardless of his scholastic achievement, may enter for the examination – or from time to time re-enter for the examination to ascertain whether progress has been made.

The Junior Examination in Bilingualism

The standard of this examination is approximately equal to that of the two official languages on the Higher or A Grade for the Junior Certificate or Std VIII Examination.

This examination will enable scholars in Stds IX and X who have not yet reached the standard required for the Senior Examination in Bilingualism, as well as school-leavers after Std VIII, to obtain a Certificate in Bilingualism.

Aim: The aim of the examination is to encourage scholars and others to raise the standard of their language qualifications to meet the special needs in our bilingual country. Furthermore it is planned to issue a certificate which will indicate to employers and others interested the standard of bilingualism attained by the candidate.

Nature: The examination consists of two papers of the same standard: one in Afrikaans and one in English. The standard attained in each language will be indicated by separate symbols, and a symbol will be given for the combined average attained in the two languages.

Entry forms may be obtained from the Secretary, S.A. Taalbond, P.O. Box 197, Stellenbosch 7600, and completed entry forms in duplicate must reach the Secretary not later than 15 June.

The examination is held towards the end of July or the beginning of August.

## CHAPTER V

### TEACHER TRAINING

#### A. GENERAL INFORMATION

Teachers for the secondary school: In terms of the National Education Policy Act, 1967 (Act No. 39 of 1967), the Minister of National Education announced during the second half of 1971 that teachers of secondary schools would be trained only at universities from 1972. Though the universities are, for the greater part, able to carry this into effect, there are certain aspects of the matter still in the process of planning. At present, for example, training for the National Teachers' Diploma (Workshop) is still being undertaken by some of the colleges for advanced technical education. There is a possibility that the universities will, in any case, in this connection as well as in other fields, co-operate closely with the colleges for advanced technical education and the provincial teacher training colleges.

Teachers for the primary and pre-primary school: Apart from the training of primary and pre-primary teachers by the universities, each province trains teachers for primary and pre-primary work at its own training colleges, and the Department of National Education has two colleges for the training of pre-primary school teachers.

Basic regulations: The whole pattern for the training of teachers at universities as well as at provincial teacher training colleges and by the Department of National Education is laid down by the "Criteria for the evaluation of South African qualifications for purposes of employment in education". Each authority compiles its own curricula and syllabi within this framework of basic regulations and each course must fulfil the minimum requirements as stipulated.

#### B. UNIVERSITIES

All the eleven South African universities offer advanced academic training for teachers, and award the degrees B.Ed., M.Ed., D.Ed. or Ph.D.

##### 1. UNIVERSITY OF CAPE TOWN

###### (a) Secondary teachers' courses

Secondary Teacher's Diploma: One year after an approved Bachelor's degree which includes a suitable combination of school teaching subjects.

Secondary Teacher's Diploma (Technical): One year of full-time study after one of the following:

- A degree in Engineering, Pure Science or Applied Science
- National Higher Diploma for Technicians (four-year course)
- National Diploma for Technicians (three-year course)
- a recognized equivalent of any one of the above.

Higher Teacher's Diploma in Commerce: Four years of full-time study after a Standard X Certificate or an equivalent certificate. The course, which is given in collaboration with the Cape College for Advanced Technical Education, provides training for secondary school teachers of commercial subjects.

Higher Teacher's Diploma in Home Economics: Four years of full-time study after a Standard X Certificate or an equivalent certificate. The course, which is given in collaboration with the Cape College for Advanced Technical Education, provides training for secondary school teachers of subjects in the field of Home Economics.

###### (b) Primary teachers' courses

Bachelor's degree in Primary Education: Four years of full-time study after a Matriculation Certificate or Standard X Certificate (Matriculation Exemption).

Post-graduate Primary Teacher's Diploma: One academic year after an approved degree including prescribed school subjects.

(c) Primary and/or secondary teachers' courses

Bachelor of Arts in Art - B.A. (Art): Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with an aggregate of at least 50 per cent. In their fourth year students are admitted to the course for the Secondary Teacher's Diploma or that for the Post-graduate Primary Teacher's Diploma.

B. Mus. (Music Education): Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with an aggregate of at least 50 per cent. Candidates must have reached a standard in Music equivalent to Grade VI of one of the Music examination bodies. In their fourth year students are admitted to the course for the Secondary Teacher's Diploma. On completion both the degree and the diploma are awarded.

Teacher's Licentiate Diploma (School Music): Four years after a Standard X Certificate. Additional admission requirements as for B. Mus. (Music Education).

Teacher's Diploma in Music (Instrumental or Vocal): Three years after a Standard X Certificate.

Special Endorsement in Music for holders of the Primary Teacher's Certificate: One year after a Standard X Certificate and a Primary Teacher's Certificate.

Specialist Teacher's Diploma in Speech and Drama: One year after

- a B.A. degree including at least two courses in Drama; or
- a B.A. degree including three courses in English and a qualification in Speech and Drama, or practical experience and studies to the satisfaction of the Head of the Department.

Special Endorsement in Speech and Drama for holders of the Primary Teacher's Certificate: Special one-year course after a Standard X Certificate and the Primary Teacher's Certificate.

(d) Other teachers' courses

Diploma for Teachers of Children Handicapped in Speech and Hearing: One academic year after an approved three-year teacher's certificate.

Diploma for Teachers of the Deaf and the Partially Hearing: One academic year after a Standard X Certificate and an approved three-year teacher's certificate.

Diploma for Teachers of Special Classes: One academic year after an approved three-year teacher's certificate.

Diploma in Clinical Remedial Teaching: One academic year after an approved three-year teacher's certificate and at least two years' teaching experience in schools.

Certificate in Teaching Physiotherapy: Four academic terms (one year) of full-time study.

Candidates must

- have passed the Matriculation examination or another examination approved by the Senate;
- hold a qualification in Physiotherapy which is registrable with the S.A. Medical and Dental Council;
- have had at least two years' approved experience in the practice of Physiotherapy; and
- submit a certificate of physical fitness.

## 2. UNIVERSITY OF NATAL

### (a) Secondary teachers' courses

University Education Diploma (Graduate) or the Higher Education Diploma (Post-Graduate): One year after an approved degree containing the requisite number of school subjects.

University Education Diploma (Non-Graduate): One year after a student has completed courses of study towards an approved degree, in such a manner that all the requirements of the degree may be fulfilled by one further year of study.

The University Education Diploma (Non-Graduate) may be converted into the Higher Education Diploma (Post-Graduate) or the University Education Diploma (Graduate) on completion by the candidate of the remaining admission requirements for such Diploma.

Higher Education Diploma: Four years of full-time study after a Standard X Certificate and a pass in both official languages, with at least one on the Higher Grade. The curriculum must be completed in one of the following fields of study: Art, Commerce, Industrial Arts, Home Economics.

This Diploma is offered by the University in conjunction with the Natal College for Advanced Technical Education.

Higher Education Diploma: Four years of full-time study after a Standard X Certificate with a pass in the first language on the Higher Grade and a pass in the second language either on the Higher Grade with an F symbol or on the Standard Grade with an E symbol; and another subject passed on the Higher Grade. The curriculum must be completed in one of the following fields of study: Arts, Science.

This Diploma is offered in conjunction with certain Colleges of Education.

Higher Education Diploma (Technical): Two years of part-time study after

- a Std X Certificate including both official languages with at least one passed on the Higher Grade, or at least four subjects at NTC III level plus the two official languages, and
- a National Diploma in a specialist direction or equivalent.

Higher Education Diploma (Post-School): Two years of part-time study after

- a Std X Certificate including both official languages, with at least one passed on the Higher Grade, or other equivalent qualifications, and
- an approved three-year education diploma that includes at least two school subjects of at least second-year degree level, or a National Diploma in a specialist direction or equivalent.

The latter two diplomas are offered in conjunction with the Natal College for Advanced Technical Education.

### (b) Other teachers' courses

Certificate in Remedial Education: One year of full-time study or two years of part-time study after

- a degree plus a recognized teaching qualification; or
- a recognized Teacher's Diploma requiring three years of training and in addition two years of approved teaching experience.

### 3. UNIVERSITY OF THE ORANGE FREE STATE

#### (a) Secondary teachers' courses

Higher Education Diploma (Post-graduate) - H.E.D.(Post-graduate): One year of full-time study or 18 months (3 semesters) of part-time study after a recognized degree which must also include approved subjects.

Higher Education Diploma (Non-graduate) - H.E.D. (Non-graduate): Four years of full-time study after a Standard X Certificate or equivalent, with or without Matriculation Exemption, and passes in both official languages. This Diploma is offered in the following fields: General; Science; Physical Education; Industrial Arts and/or Technical Drawing; Home Economics; Art Education; Commercial subjects; Dramatic Art and Theatrical Art; School Librarianship. For some of these fields there are additional admission requirements, mainly concerning school subjects passed.

Bachelor of Agriculture - B.Agric.: Three years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

This degree grants admission to the H.E.D. post-graduate course for the professional training of prospective teachers.

Bachelor of Science in Home Economics Education - B.Sc. Home Economics Ed.: Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics on the Higher Grade or 40 per cent on the Standard Grade and a pass in Physical Science and/or Biology on the Standard Grade.

Bachelor of Arts (Physical Education) - B.A. (Phys. Ed.): Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

Prospective teachers take the one-year H.E.D. curriculum after completion of the degree.

#### (b) Primary and/or secondary teachers' courses

UOFS Teacher's Diploma in Music: Four years after a Standard X Certificate. A candidate must satisfy the head of the department of his proficiency in the performing art and of his musicality and general knowledge of music. He must have obtained at least 60 per cent in Music in the Matriculation or equivalent examination, or attained a standard in the practical subject equivalent to the Grade VII Examination of the University of South Africa.

UOFS Teacher's Licentiate in Music: Three years after a Standard X Certificate.

#### (c) Other teachers' courses

Post-basic Diplomas in Nursing which include, inter alia, Post-basic Diploma in Nursing Education: One year of full-time study. A candidate must submit proof of registration as a general nurse or a psychiatric nurse and two years' appropriate experience. He/she must also hold a Standard X Certificate.

### 4. UNIVERSITY OF PORT ELIZABETH

#### (a) Secondary teachers' courses

Baccalaureus Scientiae (Educationis) - B.Sc. (Ed.) and

Baccalaureus Commercii (Educationis) - B.Com. (Ed.)

Each of the curricula of the above-mentioned two degrees is a four-year integrated academic and professional degree course which fulfils all the requirements for the degree concerned as well as the requirements for the training of teachers for secondary schools.

The admission requirements for the two degree courses is a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

An additional requirement for the B.Sc. degree course is a pass of at least 40 per cent in Mathematics on the Higher or the Standard Grade.

Additional requirements for the B.Com. degree course are: A pass of at least 40 per cent in Afrikaans and English on the Higher or the Standard Grade. For admission to courses in Mathematics or Mathematical Statistics: A pass of at least 40 per cent in Mathematics on the Higher or the Standard Grade.

Higher Education Diploma (Post-graduate) - H.E.D. (Post-graduate): One year after an approved Bachelor's degree of a recognized university which includes the minimum number of approved school subjects.

Higher Education Diploma - H.E.D. : Four years after a Matriculation Certificate or a Standard X Certificate. This Diploma may be obtained with the following endorsements: Human Sciences; Natural Sciences (in the field of Physical and Mathematical Sciences); Biological Sciences; Economic Sciences; Physical Education; Woodwork and Metalwork; School Music; Typing; Snelskrif and Shorthand.

For some of the specialized fields there are additional admission requirements mainly concerning subjects passed in the Std X examinations.

National Education Diploma (Technical) - N.E.D. (Technical): One year of full-time study after one of the following:

- An approved degree
- a Standard X Certificate or equivalent qualification \*and a qualification equivalent to Std X + 3 which includes two school subjects on a second-year degree level. (Technical subjects relating to the candidate's specialist post may be included.)

Provisional admission may be granted by the Senate to an immigrant who has been resident in the Republic for less than four years and who cannot meet the language requirements.

(b) Primary teachers' courses

Education Diploma - E.D.: Three years after a Matriculation Certificate or a Standard X Certificate. This Diploma may be obtained in either the Senior Primary or the Junior Primary field.

Diploma in Musical Education: Three years of full-time study after a Standard X Certificate. A candidate must satisfy both the Chairman of the Subject Committee for Music and the Director of the Conservatoire that he has attained a standard in practical music (any approved instrument or singing) equivalent to the Certificate Examination Grade VII of the University of South Africa; or has obtained 60 per cent in Music in the Std X examination on the Standard Grade or 50 per cent on the Higher Grade.

(c) Primary and/or secondary teachers' courses

Baccalaureus Artium (Educationis) - B.A. (Ed.): A four-year integrated academic and professional degree course which fulfils all the requirements for the B.A. degree as well as the requirements for the training of teachers. There are three curricula, namely Junior Primary Teaching, Senior Primary Teaching and Secondary Teaching.

The admission requirements for the degree course is a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). For admission to the following courses a candidate must have attained the standard indicated in each case:

\* A four-subject NTC III plus two official languages of which one must be passed on the Higher Grade, and English Language (excluding English Literature) must be one; Abitur, etc. shall be regarded as equivalent.



- Professional Afrikaans I: A pass in Afrikaans on the Higher or Standard Grade
- English I: A pass in English on the Higher or Standard Grade
- German I: A pass of at least 45 per cent on the Higher Grade or at least 40 per cent if German was taken on Mother-tongue level (Applications of German-speaking students will be dealt with individually.)
- Latin I: A pass in Latin on the Higher or Standard Grade
- Mathematics I or Mathematical Statistics I: A pass of at least 40 per cent in Mathematics on the Higher or the Standard Grade.

(d) Other teachers' courses

Diploma in Specialized Education - D.S.E. (Special classes for the mentally handicapped): Two years of part-time study after one of the following:

- A degree and a post-graduate secondary teacher's diploma
- a degree and a lower secondary teacher's diploma
- a lower secondary teacher's diploma
- a three-year primary teacher's certificate
- any three-year teaching qualification which the Senate recognizes for the purpose.

Baccalaureus Curationis (Institutionis et Administrationis - B.Cur. (I. et A.)):

Three years of full-time study or four years of part-time study.

Candidates must hold a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) and proof of registration as a nurse or male nurse with the S.A. Nursing Council. Women students who wish to take Promotive and Preventive Health Care II must be registered as Midwife, or in the case of men students, as General Nurse and Psychiatric Nurse.

Diploma in Nursing Education: The course extends over four semesters except in the case of candidates who hold a Bachelor's degree in Nursing, in which case it extends over three semesters.

Candidates must hold a Standard X Certificate and proof of registration as general nurse and as midwife, or in the case of men as general nurse and psychiatric nurse or as general nurse and orthopaedic nurse.

5. POTCHEFSTROOM UNIVERSITY FOR CHRISTIAN HIGHER EDUCATION

(a) Secondary teachers' courses

Bachelor of Science (Domestic Science) (Education) - B.Sc. (Dom. Sc. Ed.):

Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics on the Higher Grade, or alternatively, a pass in Mathematics and in a science subject, preferably Physical Science, on the Standard Grade.

Higher Education Diploma (post-graduate) - H.E.D. (post-graduate): One year after an approved degree of a recognized university which includes the minimum number of prescribed school subjects.

Higher Education Diploma (post-graduate) (Guidance) - H.E.D. (post-graduate)

(Guidance): One year after a B.A., B.Sc. or B.Comm. (Industrial Psychology) degree with a major in Psychology and which also includes two school subjects of which one must be at least on second-year level and the other at least on first-year level. One course in Sociology or Social Work is recommended for the B.A. degree.

Higher Education Diploma (post-graduate)(School Librarianship): One year after an approved Bachelor's degree with Library Science I and II in the curriculum.

Higher Education Diploma for Secondary Schools: Four years after a Matriculation Certificate or a Standard X Certificate. The course will, with regard to the academic part, be adapted to the needs of the various specialized fields, for example Domestic Science and Music. Uniform curricula, but with optional subjects, are recommended for the following specialized fields: Human Sciences, Pure Sciences, Economic Sciences, Music, Domestic Science, Industrial Arts, School Librarianship, Art.

Potchefstroom University Teacher's Licentiate in Music: Three years after a Matriculation Certificate or a Standard X Certificate.

A student must satisfy the Head of the Department of Music in a practical and theoretical test that his standard is high enough to attend the course with profit. He must have passed Music as a subject for the Std X examination or have obtained the advanced standard of the University of South Africa in the chosen practical subject.

Bachelor of Arts with Physical Education as a major subject - B.A.: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). A student must ascertain beforehand whether he is medically fit for the course.

Bachelor of Science with Physical Education as a major subject - B.Sc.: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics on the Higher Grade, or alternatively a pass in Mathematics and a science subject, preferably Physical Science, on the Standard Grade.

After obtaining one of the above-mentioned degrees a student may take the one-year course, H.E.D. (post-graduate).

(b) Primary teachers' courses

Education Diploma for Primary Schools: Four years after a Matriculation Certificate or a Standard X Certificate. During the first three years all the students take a general primary school course and in the fourth year, should it be offered, they have a choice between a senior primary course in general school subjects or in remedial teaching for the primary school.

Higher Education Diploma (Primary Education): One year after an approved degree which includes the required school subjects, or an approved three-year teacher's diploma.

(c) Other teachers' courses

Diploma in Nursing Education (graduate): One year after a degree in Nursing which includes a course in Anatomy.

6. UNIVERSITY OF PRETORIA

(a) Secondary teachers' courses

Bachelor of Arts (Education) - B.A. (Ed.)

Bachelor of Commerce (Education) - B.Com. (Ed.)

Bachelor of Science (Education) - B.Sc. (Ed.)

Each of the curricula of the above-mentioned degrees is a four-year integrated academic and professional degree course which fulfils all the requirements for the degree concerned as well as the requirements for the training of teachers for the

secondary school.

The admission requirement for the three degree courses is a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

Additional admission requirements for the B.A. degree course:

- A candidate must have obtained a pass on the Higher Grade in at least two of the following subjects:  
History, Geography, Mathematics, Biology, Physical Science, a third language.
- A candidate will not be admitted to the English IA course unless he obtained at least 50 per cent in English on the Standard Grade or a pass in English on the Higher Grade.
- A candidate will not be admitted to the French IA course unless he passed French in the Matriculation or Standard X examinations.

Additional requirement for the B.Com. degree course is a pass in Mathematics on the Higher Grade or at least 40 per cent on the Standard Grade.

Additional requirements for the B.Sc. degree course are passes in Mathematics and Physical Science on the Higher Grade or at least 50 per cent on the Standard Grade.

Bachelor of Agriculture (Education) - B. Agric. (Ed.): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics and Physical Science on the Higher Grade or at least 50 per cent on the Standard Grade.

Bachelor of Arts (Education) (Art) - B.A. (Ed.) (Art): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). See B.A. (Ed.) for additional requirements.

Art as a Std X subject is not a requirement. Candidates must, however, take a practical test to determine whether they have the necessary ability to attend the courses with profit.

Bachelor of Arts (Education) (Music) - B.A. (Ed.) (Music): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). A candidate must satisfy the lecturers concerned in a practical test that his proficiency in the performing art as well as his musicality and general knowledge of music justifies admission.

Bachelor of Science in Domestic Science (Education) - B.Sc. (Dom.Sc.) (Ed.): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). See B.Sc. (Ed.) for additional requirements.

Bachelor of Arts in Physical Education - B.A. (Phys. Ed.): Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). The additional admission requirements are the same as for the B.A. degree. See B.A. (Ed.) p.185.

Prospective teachers take the one-year H.E.D. curriculum after completion of the degree.

Bachelor of Arts (Education) (Physical Education) - B.A. (Ed.) (Phys. Ed.): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with Afrikaans and English as subjects passed. The additional admission requirements are the same as for the B.A. degree. See B.A. (Ed.) p.185.

Higher Education Diploma (Post-graduate): One year of full-time study after a Bachelor's degree which either includes the minimum number of courses in approved school subjects or is recognized for teaching purposes irrespective of the subject combination.

Higher Education Diploma (Post-graduate) (Extramural): An extramural course extending over three semesters. Only candidates who are employed in a permanent capacity and who have fulfilled the admission requirements for the aforementioned one-year full-time post-graduate course will be admitted to the extramural course.

Higher Education Diploma: Four years of full-time study after a Matriculation Certificate or a Standard X Certificate with Afrikaans and English as subjects passed. This Diploma is offered with the following endorsements: General; Commerce; Commerce Secretarial; Home Economics; Woodwork and Metalwork; Music; Physical Education; Technical Education.

With the exception of two cases, there are additional admission requirements for each endorsement (specialized field) mainly concerning subjects passed in the Std X examinations.

(b) Primary teachers' courses

Bachelor of Arts (Education) (Senior Primary) - B.A. (Ed.) (Senior Primary)  
and

Bachelor of Arts (Education) (Junior Primary) - B.A. (Ed.) (Junior Primary)

Each of the curricula of the above-mentioned two degrees is a four-year full-time integrated academic and professional degree course which fulfils all the requirements for the B.A. degree as well as the requirements for the training of teachers for primary schools. The admission requirements are the same as for the ordinary B.A. degree. See B.A. (Ed.) p. 185.

(c) Primary and/or secondary teacher's course

Diploma in Music (Individual Teaching): Three years of full-time study after a Standard X Certificate. See B.A. (Ed.) (Music) p. 186.

(d) Pre-Primary teacher's course

Bachelor of Arts (Education) (Pre-Primary) - B.A. (Ed.) (Pre-Primary): The curriculum is a four-year integrated academic and professional degree course which fulfils all the requirements for the B.A. degree as well as the requirements for the training of pre-primary teachers. The admission requirements are the same as for the ordinary B.A. degree. See B.A. (Ed.) p. 185.

(e) Other teachers' courses

Diploma in Specialized Education (Special Education - Handicapped children):

One year of full-time study after a recognized three-year teacher's certificate obtained after a Std X Certificate.

Higher Education Diploma (Post-graduate) (Special Education - Handicapped children): One year of full time-study after a Bachelor's degree and a one-year post-graduate teacher's diploma.

Diploma in Orthopedagogics: One extended academic year after:

- A Bachelor's degree with Psychology III or Sociology III and/or Social Work III; or
- the B.A. (Log.) degree of the University of Pretoria; or
- other qualifications which the Faculty Council may regard as adequate for admission.

This Diploma is not recognized for education purposes.

Teachers' Diploma in Occupational Therapy: One year of full-time study after a qualification in Occupational Therapy which is registrable with the S.A. Medical and Dental Council and is recognized by the College of Occupational Therapy as adequate basic training; and at least two years' experience in an approved hospital as a registered Occupational Therapist. (Exemption from the aforementioned requirements may, in exceptional cases, be considered on merit by the Council of the Faculty.)

Teacher's Diploma in Physiotherapy: One year of full-time study after a qualification in Physiotherapy which is registrable with the SA Medical and Dental Council and is recognized by the College of Physiotherapy as adequate basic training for admission; and at least two years' experience in an approved hospital as a registered Physiotherapist. (Exemption from the aforementioned requirements may, in

exceptional cases, be considered on merit by the Council of the Faculty.)

Diploma in Nursing Education: At least one-and-a-half academic years of full-time study. Candidates must hold a Matriculation or a Standard X Certificate, and must submit proof of registration as general nurse/male nurse or psychiatric nurse/male nurse. A candidate who wishes to take Midwifery must be registered as a midwife.

Bachelor of Nursing (Instruction and Administration) - B.Cur. (I. et A.): Three years of full-time study or at least four years of part-time study. Candidates must hold a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption), and proof of registration as nurse/male nurse with the SA Nursing Council. A candidate who wishes to take Promotive and Preventive Health Care II with a view to recognition by the SA Nursing Council as a community health nurse, must also submit proof of registration as a midwife or, as a general nurse and psychiatric nurse.

## 7. RAND AFRIKAANS UNIVERSITY

### (a) Secondary teachers' courses

B.A. (Education) - B.A. (Ed.)

B. Bibl. (Education) - B. Bibl. (Ed.)

B. Com. (Education) - B. Com. (Ed.)

B.Sc. (Education) - B.Sc. (Ed.)

Each of the curricula of the above-mentioned four degrees is a four-year integrated academic and professional degree curriculum which fulfils all the requirements for the degree concerned as well as the requirements laid down by the Committee of Heads of Education for the training of teachers for secondary schools.

The admission requirement is a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

Additional admission requirements for the B.A. degree course: For admission to specific courses, viz German I, French I or Latin I, a candidate must have obtained a pass (40 per cent) in the corresponding subject on the Higher Grade.

Additional requirements for the B.Com and the B.Sc. degree: A pass (40 per cent) in Mathematics on the Higher Grade or at least 50 per cent on the Standard Grade.

Post-graduate Higher Education Diploma - H.E.D. (Post-graduate): One summer term (approximately 1½ months) and two semesters of full-time study after an approved Bachelor's degree which includes the minimum number of subjects for teaching purposes as stipulated by the Committee of Heads of Education.

Four-year Higher Education Diploma - H.E.D.: Four years of full-time study after a Matriculation Certificate or a Standard X Certificate with Afrikaans and English as subjects passed. This Diploma may be obtained in the following fields: Languages and Human Sciences; Commercial field (academic subjects); Commercial field (subjects requiring proficiency); Physical Education; Librarianship.

For each of these fields there are additional admission requirements, mainly concerning pass marks in particular subjects in the Matriculation and Standard X examinations.

One-year Post-graduate Higher Education Diploma (Technical): As for the H.E.D. (Post-graduate) provided that one of the subject didactics must be in a technical field.

One-year Higher Education Diploma (Technical): One summer term and two semesters of full-time study after a Standard X Certificate or equivalent qualification and a three-year diploma which includes at least two school subjects (technical subjects) on second-year level, e.g. motor mechanics, electricity, radio mechanics, woodworking, plumbing, and welding and metalwork.

(b) Other teachers' courses

Bachelor of Nursing Instruction and Administration - B.Cur. (Ed. et Adm.): Three years of full-time study or at least four years of part-time study. A candidate must hold a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) and proof of registration as a nurse/male nurse with the SA Nursing Council in General Nursing and in Psychiatric Nursing or Midwifery.

Diploma in Nursing Instruction: One-and-a-half years of full-time study. The course extends over one year for candidates who hold an approved Bachelor's degree in Nursing.

A candidate must hold a Standard X Certificate and proof of registration as a nurse/male nurse with the SA Nursing Council.

8. RHODES UNIVERSITY

(a) Secondary teachers' courses

Higher Education Diploma (Graduate): One year after an approved degree with certain specified courses included in the curriculum for that degree.

Higher Education Diploma (Non-Graduate): Four years after a Matriculation Certificate or a Standard X Certificate. The curriculum for the Diploma shall be arranged in accordance with certain provisions with regard to the courses to be followed.

Rhodes University Licentiate Diploma in Music - R.U.L.M.: Three years after a Standard X Certificate, or the Board of the Faculty must be satisfied as to the candidate's suitability to take the course. The latter is considered only on the grounds of mature age and/or exceptional ability.

The Diploma may be awarded as a diploma for performers, or for teachers, or for choirmasters, or for church organists.

Diploma in Physical Education - Dip. Phys. Ed.: One year of full-time study after a Bachelor's degree or a recognized teacher's diploma; and a medical certificate.

(b) Primary teachers' courses

Higher Education Diploma (Graduate, for senior-primary school teachers): One year after a Bachelor's or higher degree which includes certain prescribed school subjects.

Lower and Higher Primary Teachers' Certificate - L.P.T.C./H.P.T.C.: Three years after a Standard X Certificate.

9. UNIVERSITY OF SOUTH AFRICA

(a) Secondary teachers' courses

Higher Education Diploma (Post-graduate) - H.E.D. (Post-graduate): One or two years after an approved degree which includes the required number of courses in the approved school subjects and a teacher's diploma recognized by the Senate; or at least two years after the above-mentioned degree without a diploma; provided that the completion of the H.E.D. (Post-graduate) shall be subject to at least twenty weeks' satisfactory experience as a teacher or as a lecturer at a teacher's training college in a South African Education Department or in a teacher's training section of a university.

Higher Education Diploma (Technical) - H.E.D. (Technical): A student shall

- hold a Standard X Certificate or an equivalent qualification;
- have passed one of the two official languages on the higher grade and the other on the lower or higher grade at Std X level; provided that an immigrant who has

been resident in the Republic for less than four years and has not yet complied with this requirement, may be admitted provisionally;

- hold a qualification evaluated by the Committee of Heads of Education as M + 3 (Category C) and which included two recognized school subjects.

The curriculum extends over at least two years.

(b) Tertiary teacher's course

Diploma in Tertiary Education - D.T.E.: A student must hold at least a Bachelors's degree. The Diploma will not, however, be issued until a student has completed at least two years' appropriate experience in an institution providing training at tertiary level.

The examination consists of two parts which may be written separately or simultaneously.

(c) Secondary and/or primary teachers' courses

Certificate in School Library Science: (N.B. This Certificate does not comply with the criteria for the evaluation of South African qualifications for purposes of employment in Provincial Education Departments.)

A student must hold:

- A lower diploma in Library Science; or
- a teacher's certificate; or
- a university degree.

The curriculum extends over at least one academic year.

Diploma in Special Education: School Library Science: At least one academic year after

- an approved three-year or four-year teacher's diploma; or
- an approved degree and an approved post-graduate education diploma; or
- an approved combined education degree.

(d) Pre-Primary teachers' courses

Higher Education Diploma (Pre-Primary) - H.E.D. (Pre-Primary) and

Higher Education Diploma (Post-graduate Pre-Primary) - H.E.D. (Post-graduate Pre-Primary) : At least two years after:

- A recognized teacher's diploma issued after a three-year teacher's training course; or
- a degree which includes the required number of courses in the approved school subjects, and at least one course in each of the official languages and at least one course in Education or at least one course in each of two of the following: Sociology, Psychology, Logopedics, Social Work.

Diploma in Nursery Education - D.N.E.

(N.B. This Diploma does not comply with the criteria for the evaluation of South African qualifications for purposes of employment in Provincial Education Departments.)

The curriculum extends over at least two years after:

- A recognized two-year teacher's diploma for admission to which a Std X Certificate was required; or
- a degree with three courses in one and at least one course in another of the following subjects: Psychology, Sociology, Social Work, Education, Philosophy; or
- a degree, or a diploma for which a Std X Certificate was a prerequisite, in nursing, speech therapy, physiotherapy, occupational therapy or social work.

(e) Other teachers' courses

Diploma in Specialized Education - D.S.E.

(i) Special Education

The University offers teacher's diplomas in special education for:

- The visually handicapped (blind and partially-sighted);
- the aurally handicapped (deaf and hard of hearing);
- the epileptic;
- the cerebral palsied.

The curriculum extends over at least two years after:

- A recognized teacher's diploma issued after a three-year teacher's training course; or
- a degree and a recognized teacher's diploma.

(ii) Remedial Education

The curriculum extends over at least two years after:

- A recognized teacher's diploma issued after a three-year teacher's training course; or
- a degree and a recognized teacher's diploma.

Diploma for Therapists (Special Education) - D.T.S.E.: At least two years after an appropriate degree or an appropriate three-year diploma in Physiotherapy, or Occupational Therapy, or Speech Therapy by virtue of which the South African Medical and Dental Council has approved registration with the Council as a physio-therapist, or an occupational therapist, or a speech therapist.

Certificate in Special Education - C.S.E.: (Special education for epileptics, the cerebral palsied, the visually handicapped, the aurally handicapped.)

(N.B. This Certificate is not recognized for salary purposes by the Department of National Education or the Provincial Education Departments. Teachers in the employment of, or who intend seeking employment with the Administration of Coloured Affairs, the Department of Indian Affairs or the Department of Bantu Education should enquire from these Departments about the recognition for salary purposes which they will receive for the possession of the C.S.E.)

The curriculum extends over at least two years after a recognized teacher's diploma issued after a two-year teacher's training course for admission to which a Standard X Certificate was required.

10. UNIVERSITY OF STELLENBOSCH

(a) Secondary teachers' courses

Bachelor of Agricultural Education: Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with passes in Mathematics and Physical Science on the Standard Grade.

B.Sc. in Home Economics (Ed.): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with passes in Mathematics and Physical Science of which at least one must be on the Higher Grade.

B. in Home Economics (Ed.): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics or Physical Science on the Standard Grade.

B. Mus. (Ed.) Specialization: Teaching of an Instrument or Singing  
and

B. Mus. (Ed.) Specialization: School Music: Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with either a



pass in Music of at least 50 per cent on the Higher Grade or 60 per cent on the Standard Grade; or a pass in the practical major subject in the Grade VII Examination (University of South Africa) and a standard in Harmony equivalent to that of Grade VI (University of South Africa); or a pass in an admission examination, equivalent to the aforementioned examination, in the practical major subject and in Harmony.

B.A. with Physical Education as one of the major subjects: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). A medical certificate is required.

B.Sc. with Physical Education as one of the major subjects: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with passes in Mathematics and Physical Science, one of which must be on the Higher Grade. A medical certificate is required.

After obtaining one of the latter two degrees, a student may take the one-year course, H.E.D. (Post-graduate).

Higher Education Diploma (Post-graduate) (Secondary) - H.E.D.: One year after a Bachelor's degree of a recognized university which includes the minimum number of school subjects.

Four-year Higher Education Diploma (Secondary) - H.E.D.: Four years of full-time study after a Matriculation Certificate or a Standard X Certificate. This Diploma may be obtained in the following specialized fields: Human Sciences and Languages; Natural Sciences; Commerce; Physical Education; Home Economics and Needlework.

Students who wish to specialize in Natural Sciences must hold a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption) with a pass in Mathematics.

Higher Education Diploma (Secondary - Music) - H.E.D. (Secondary - Music): Four years of full-time study after a Matriculation Certificate or a Standard X Certificate. Additional admission requirements are the same as for the B. Mus. (Ed.) degree.

This Diploma may be obtained in the following specialized fields: Teaching of an Instrument or Singing; School Music.

(b) Primary teachers' courses

Bachelor's degree course in Primary Education (General field): Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption), provided that the candidate has passed in at least one Mathematical/Arithmetical subject in the Junior Certificate (Standard VIII) examination and obtained a satisfactory standard in both the official languages in the final examination in Std IX and the June examination in Std X.

A pass in Mathematics and a science subject on the Standard Grade in the Matriculation examination is required for admission to Mathematics III (Ed.) and Natural Science III (Ed.) respectively.

Bachelor's degree course in Primary Education with Specialization in Learning and Educational Difficulties: Four years. The following are admitted:

- Students who have passed the second year of study for the Bachelor's degree course in Primary Education (General field);  
or, in the case of students from other training institutions, who qualify for admission to the third year of study for the B. degree course in Primary Education (General field); and
- on written application are admitted to the course by the Senate, or by the Executive Committee acting for the Senate.

Bachelor's degree course in Primary Education with Specialization in School Music: Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption), provided that the candidate

- obtained at least a 60 per cent pass mark in Music (examination subject) in Std VIII or

- passed the Grade VI (Intermediate) Examination in piano at the University of South Africa; or
- sat for an entrance examination in piano equivalent to the above-mentioned examinations.

Students must also give proof of a basic ability in the use of the singing voice.

A satisfactory standard in both the official languages must have been obtained in the final examination in Std IX and in the June examination in Std X.

Bachelor's degree course in Primary Education with Specialization in Physical Education: Four years after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). Also see the Bachelor's degree course in Primary Education (General field).

Higher Education Diploma (Primary) (School Music): One year after an approved three-year Primary Teachers' Diploma. Students must pass an entrance examination in Piano in which the standard of Grade VII of the University of South Africa is required. Candidates who obtained a pass during the preceding year in the Grade VII or higher examination in Piano of Unisa or the Associated Board of Royal Schools of Music are exempted from the aforementioned entrance examination.

Persons who have already studied School Music as an intensive specialized field may not be admitted to this course.

Higher Education Diploma (Primary) (Speech and Drama): One year after an approved three-year Primary Teachers' Diploma. Persons who had Speech Training as a third year subject for the Primary Teachers' Diploma may not be admitted.

(c) Secondary and/or Primary teacher's course

Teachers' Licentiate in Music: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate, provided the candidate has obtained

- a pass mark in Music of at least 60 per cent in the Standard X examination, or
- a pass in the Grade VII Examination (University of South Africa) in the practical major subject, with a standard in Harmony equivalent to Grade VI (University of South Africa), or
- a pass mark in the entrance examination, equivalent to the above-mentioned examinations, in the practical major subject and in Harmony.

Diploma in Specialized Education (School Librarianship): One year after an approved three or four-year teacher's diploma; or an approved degree followed by an approved teacher's diploma; or an approved combined education degree. Students who have already specialized in School Librarianship may not be admitted.

(d) Other teachers' courses

Diploma in Special Education: Three years after a recognized degree with Psychology as a major subject as well as a teachers' certificate, or other qualifications approved by the Senate for this purpose. Candidates must already be employed as school psychologists and/or teachers of retarded children.

Candidates must attend intensive courses of two weeks each at the University of Stellenbosch twice a year.

Diploma in Specialized Education (Clinical Remedial): One year of full-time study after successful completion of at least a three-year teachers' training course; at least three years' teaching or other adequate experience and admission to the course through written application to the Senate.

Diploma in Specialized Education (Mentally Retarded): One year after:

- The Higher Primary Teachers' Diploma of this University or another three-year teachers' diploma or certificate which can be regarded as equivalent thereto; or
- a degree and the Higher Education Diploma of this University or equivalent qualifications.

Teacher's Diploma in Occupational Therapy: Two years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption); a qualification in Occupational Therapy which is registered with the SA Medical and Dental Council; and at least two years' experience as an occupational therapist in an approved hospital.

Diploma in Nursing Education: Two years of full-time study after a Standard X Certificate; a certificate of registration as a general nurse with the SA Nursing Council, and two years' experience as a registered nurse, of which one year must be practical nursing experience in the clinical sections of a training hospital for nurses.

11. UNIVERSITY OF THE WITWATERSRAND

(a) Secondary teachers' courses

Higher Education Diploma (Post-graduate): One year of full-time study or two years of part-time study after an approved degree which includes a suitable combination of school teaching subjects.

Higher Education Diploma: Four years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption). The Senate may, for an interim period until the end of 1979, grant admission to a person who is not so qualified but who holds an approved Std X Certificate.

Every curriculum shall include, inter alia:

- Four courses in one of the following practical subjects, one course in each year of the curriculum:

- Home Economics
- Industrial Arts
- Instrumental Music Performance
- Physical Education
- Typewriting

- courses in certain prescribed academic subjects.

(b) Secondary and/or primary teachers' courses

Licentiate in Music - L.M.: Three years of full-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption).

Performer's Diploma in Music - P.Dip. Mus.: One year of full-time study or two years of part-time study after

- the Diploma in Music of this or another university; or
- the Licentiate in Music; or
- the B. Mus. degree; or
- a teacher's or performer's diploma or licentiate in music from a recognized institute and at least four years' experience in education or four years' experience in public performance.

(c) Other teachers' courses

Diploma in Education of the Deaf  
Two years after

- a recognized teacher's diploma obtained after not less than two years' study after having obtained a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption); and
- the curriculum for the teacher's diploma must have contained an approved course in Psychology and courses in spoken English and spoken Afrikaans.

Diploma in Specialized Education (Remedial Education) - Dip. Spec. Ed. (Rem. Ed.):

Two years of part-time study after

- a degree and a recognized teachers' diploma and at least two years' experience in education; or
- a recognized teachers' diploma and a Standard X Certificate (Matriculation Exemption) and at least five years' experience in education; or
- a degree and at least three years' experience in education.

Diploma in Nursing Education: One-and-a-half years of full-time study.

A candidate must

- hold a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption); and
- be registered by the S.A. Nursing Council as a general nurse or a general nurse (male) or psychiatric nurse with at least 18 months' experience as a nurse of which period at least one year must have been in an approved training institution for nurses: provided that a graduate who holds a Bachelor's degree in Nursing is required to have been engaged in the practice of nursing for only one year in a training institution.

Diploma in Physiotherapy Education: Two years of part-time study after a Matriculation Certificate or a Standard X Certificate (Matriculation Exemption); a qualification in Physiotherapy which is accepted for registration with the S.A. Medical and Dental Council; and at least two years' approved experience in the practice of Physiotherapy.

## C. P R O V I N C I A L T E A C H E R S ' C O L L E G E S

### 1. TRAINING INSTITUTIONS

DEPARTMENT OF EDUCATION, CAPE OF GOOD HOPE

- The Teachers' College, Cape Town  
(English medium)
- The Teachers' College, Graaff-Reinet  
(Parallel medium)
- The Teachers' College, Oudtshoorn  
(Afrikaans medium)
- The Teachers' College, Paarl  
(Afrikaans medium)
- The Teachers' College, Port Elizabeth  
(English medium)
- Denneoord Teachers' College, Stellenbosch  
(Afrikaans medium)
- The Teachers' College, Wellington  
(Afrikaans medium)

NATAL EDUCATION DEPARTMENT

- Durban Teachers' Training College, Durban  
(Afrikaans medium)
- Edgewood College of Education, Pinetown  
(English medium)
- Natal Training College, Pietermaritzburg  
(English medium)

O.F.S. DEPARTMENT OF EDUCATION

- Teachers' College, Park Road, Bloemfontein

TRANSSVAAL EDUCATION DEPARTMENT

- Die Goudstadse Onderwyskollege, Johannesburg
- The Johannesburg College of Education, Johannesburg
- Die Potchefstroomse Onderwyskollege, Potchefstroom
- Die Pretoriase Onderwyskollege, Pretoria

## 2. GENERAL ADMISSION QUALIFICATIONS

Unless otherwise stated the general admission qualifications to the courses for primary and pre-primary teachers are as follows:

- (i) A Senior Certificate issued by one of the Education Departments in the RSA or the Joint Matriculation Board on completion of a senior secondary school course, or other qualifications equated to these by the Committee of Heads of Education.
- (ii) A candidate must pass in both official languages with at least a pass in the first language on the Higher Grade.
- (iii) A candidate must pass in one other subject on the Higher Grade, excluding the official languages.

OR

With the exception of candidates under (i), (ii) and (iii) above, all candidates who have passed one of the old Std X examinations will, in the course of an interim period, qualify for admission to a training course.

## 3. PRE-PRIMARY TEACHERS' COURSES

### The three-year training courses

The three-year training courses for teachers of pre-primary work include the following prescribed subjects which are to be studied during the three years:

Religious Instruction; Afrikaans; English; Psychology; Sociology; Infant Health Care; Afrikaans and English Infant Literature; Education (Pedagogics); and intensive training in one of the following practical subjects, as well as courses in the remaining three:

Developmental Play; Infant Music; Art; Handicraft.

Twelve weeks' practical teaching is also required. All candidates must also attain a certain standard of bilingualism which will either be endorsed on their diplomas or a special certificate will be issued to them.

### Education departments

Cape Province and Natal.

### The four-year training courses

In the first place all the requirements for the three-year course apply to these courses, but with further intensive study in the following subjects:

- (a) Education (Pedagogics) which includes Historical, Psychological, Sociological and Didactic Pedagogics (Teaching Method) as well as Organization and Administration of Education (comparable to a second-year degree course)
- (b) Two more practical subjects from the group: Developmental Play, Infant Music, Art and Handicraft, OR instead of one practical subject a more intensive course in Pedagogics so that it will be equivalent to a third-year degree course
- (c) Specialization in one of the subjects Afrikaans, English, Physical Science, Biblical Studies, History, Geography, Mathematics, Biology (comparable to a first-year or second-year degree course)
- (d) A special course in Orthopedagogics (Remedial Education) or Psychodiagnostics (analysis of psychological problems among children) and Pedotherapy (treatment of children with psychological problems) (comparable to a first-year degree course).

At least three weeks' practical teaching is required.

### Education departments

Cape Province, Orange Free State and Transvaal.

### One-year training courses following on a three-year training course

The admission qualification for these courses is a teachers' diploma of which the training extended over at least three years. The subjects to be studied are Education (Pedagogics); the practical subjects Developmental Play, Art, Handicraft

and Infant Music; Infant Health Care; and Orthopedagogics/Psychodiagnostics and Pedotherapy. In addition, competency in both the official languages and at least three weeks' practical teaching are required.

Education department

Orange Free State.

4. PRIMARY TEACHERS' COURSES

The three-year training courses

The following subjects, as arranged by each authority, must be studied during the three years of the courses:

Religious Instruction; Afrikaans; English; History; Mathematics; Natural Science; Geography; Health Education; Environmental Studies or Social Science (for the Junior Primary Course); Writing and Blackboard Technique; School Librarianship and Audio-visual Education; Biblical Studies.

- (a) A standard comparable to a first-year degree course must be attained in one of the official languages as well as in at least one of the following: Mathematics; History; Geography; Physical Science; Biology; German (for candidates who are going to teach in South-West Africa); Natural Science (not to be taken together with Physical Science or Biology)
- (b) Intensive training in one of the following or another subject from (a): Physical Education; School Music; Art; Handicraft; Speech and Drama; School Librarianship; Instrumental Music
- (c) At least one of the following subjects is compulsory for all candidates: School Music; Physical Education; Handicraft; Art
- (d) Pedagogics, including Historical, Philosophical, Psychological, Didactic and Sociological Pedagogics, as well as Organization and Administration of Education (comparable to a first-year degree course).

At least twelve weeks' practical teaching as well as competency in both the official languages is required.

Education departments

Cape Province, Natal, Orange Free State and Transvaal.

The four-year training courses

In the first place all the requirements for the three-year courses also apply to these courses in addition to more intensive study of -

- (a) Pedagogics (comparable to a second-year degree course) OR  
One of the following on a level equivalent to that of a second-year degree course: Natural Science (not to be taken together with Physical Science or Biology); Mathematics; History; Geography; Biblical Studies; Afrikaans; English; Physical Science; Biology; Agriculture; German (for South-West Africa)
- (b) Specialization in one of the following: Ballet; Physical Education; School Music; Art; School Librarianship; Instrumental Music; Handicraft; Speech and Drama

OR

A subject from (a) on the level of a first-year or second-year degree course

- (c) Another subject from (a) on a level at least equivalent to a first-year degree course
- (d) A specialization course in Remedial Education, or in Ballet or Instrumental Music, if not already taken under (b) (on a level at least equivalent to a first-year degree course)

OR

a subject from (a) on the level of a first-year or second-year degree course.

Competency in both the official languages as well as at least three weeks' practical teaching are required.

Education departments

Orange Free State and Transvaal.

The one-year training courses following on a three-year diploma course

The admission qualification for these courses is a primary teachers' diploma of which the training extended over at least three years.

The following subjects are studied:

- (a) Pedagogics, which includes Historical, Philosophical, Psychological, Didactic and Sociological Pedagogics, as well as Organization and Administration of Education

OR

A general course in Education with special emphasis on the didactics (teaching method) of the subjects selected under (b) below, and equivalent to a second-year degree course

OR

One of the following on a level equivalent to that of a second-year degree course: Physiology (not together with Biology); Mathematics; History; Geography; Biblical Studies; Afrikaans; English; Physical Science; Biology; Agriculture; German (for South-West Africa); Natural Science (not together with Physical Science or Biology)

- (b) Two subjects from (a) and/or from the following group, one on the level of a first-year degree course and the other on the level of a second-year degree course, OR three subjects, each on the level of a first-year degree course: Physical Education; School Music; Art; School Librarianship; Instrumental Music; Handicraft or Industrial Arts; Speech and Drama; Ballet.

In lieu of any of these subjects a specialization course in Remedial Education or Orthopedagogics or Special Education (for handicapped children) or Infant School Method can be taken.

At least three weeks' practical teaching is required.

Education departments

Cape Province and Natal.

The one-year post-graduate training course for the senior primary school

The admission qualification for this course is an approved degree including at least one course in each of the following subjects: Afrikaans, English and one from the group Mathematics, History, Geography, Biblical Studies, Physics and Chemistry, Biology, German (for South-West Africa).

The subjects studied are Religious Instruction; Pedagogics, including the method of Afrikaans, English and another subject; use of the school library; Audio-visual education; Writing and Blackboard Technique; at least one of the practical subjects Physical Education, Art, School Music and Handicraft OR in place of the practical subject a course in Remedial Education or Orthopedagogics or Special Education.

Competency in both the official languages as well as seven weeks' practical teaching are required.

Education department

Transvaal.

5. OTHER TEACHERS' COURSES

One-year training courses for special education or remedial education

The admission qualification for these courses is a diploma for an approved three- or four-year training course or an approved degree together with an approved teachers' diploma.

The following subjects are studied:

- (a) At least four subjects, three on the level of a first-year degree course and the other on the level of a second-year degree course, from the following: Orthopedagogics; Psychology of the development of the concept of language and of number; Background study to learning problems; Psychological and Scholastic Testing (for Remedial Education only); Remedial Procedures (for Remedial Education only); Historical Orthopedagogics; Psychological Orthopedagogics; Orthodidactics; Speech Science and Audiology; Elementary Optometry; Communication Pedagogics, related to the field of specialization
- (b) Anatomy, neurology, physiology and pathology as applicable to the field of specialization OR  
Mental retardation and special impediments, both on the level of a first-year degree course
- (c) Handicraft for special education only.  
At least six weeks' practical teaching is required.

Education departments

Remedial education: Orange Free State

Special education: Natal and the Orange Free State.

D. THE DEPARTMENT OF NATIONAL EDUCATION

1. PRE-PRIMARY TEACHERS' COURSES

- (a) The three-year training courses. See p.196.
- (b) The four-year training courses. See p.196.
- (c) The one-year training courses following on a three-year training course. See p.196.

Training colleges

Barkly House Training College for Nursery Education, Claremont, Cape Town  
Training College for Nursery School Teachers, Houghton, Johannesburg.

2. SECONDARY TEACHERS' COURSE

NATIONAL TEACHERS' DIPLOMA (WORKSHOP)

Admission qualification: Students must hold (i) the National Senior Certificate (Technical) and an apprenticeship; or (ii) the National Technical Certificate Part III and the two official languages on the Std X level as well as an apprenticeship; or (iii) a recognized equivalent certificate, the two official languages (Std X level) and an apprenticeship.

N.B.: Candidates must have had at least two years' recognized post-apprenticeship experience in industry.

Nature and duration of the course: The course extends over one year of full-time study.

Training centre

Pretoria College for Advanced Technical Education, but up to 31 December 1980 only. As from 1979 nobody will be admitted to the course for the first time.

3. TERTIARY TEACHERS' COURSE

NATIONAL HIGHER DIPLOMA FOR POST-SCHOOL EDUCATION

Admission qualifications: A Standard X Certificate or equivalent and appropriate qualifications for a specialist post which are evaluated at at least Category C for the instruction of a specific subject or course.

The candidate must have passed both official languages on Standard X level, with at least one on the Higher Grade: provided that provisional admission may be



granted to immigrants who have been resident in the Republic for less than four years and who have not yet satisfied the language requirements.

#### Nature and duration of the course

The course extends over one year of full-time study or two years of part-time study. If the course is taken through correspondence, it will also extend over two years.

#### Subjects

Biblical Instruction	General Didactics
Historical and Comparative Education	Method of particular subject
Philosophy of Education	Post-school Teaching Method
Psycho-pedagogics	Audio-visual Teaching Aids

Practical teaching (at least 6 weeks)

A Language proficiency test.

#### Training centres

Pretoria College for Advanced Technical Education

Witwatersrand College for Advanced Technical Education (External Studies).

#### Vocational service

Anybody who becomes a teacher embarks upon a very special career, one which entails greater responsibility and imposes higher demands on the dedicated person than any other career. There are, of course, some persons in the profession who cruise comfortably through their careers, without worrying too much about the responsibility which rests on them, but it is to be hoped that they are few in number.

There are also persons who enter the profession for reasons other than the desire to render service as true educators, those, for instance, who go to a teacher training institution because they find it easy to obtain financial assistance to study; or because they think that the training courses are easier than others; or because they want to use the training for another purpose, thus making of teaching a stepping-stone to what they regard as something better; or because teachers have 'so many holidays'; or because it appears to be an 'easy' job which requires less exertion than other occupations; or because they are not 'clever' enough to become doctors, advocates, engineers, architects or building contractors; or simply because they can find nothing else to do.

The teaching profession can - and must - do without these people because the education of our children is too important to be entrusted to them.

What demands are imposed on the "good" teacher? Here are a few:

- The good teacher must possess above-average intelligence, the more superior the better. He (or she) will normally have to deal with children at all intellectual levels, from "below-average" to highly superior, and must be intellectually equipped to do so.
- The good teacher must possess the correct type of temperament and personality for the job. He (she) must be of high integrity, with vision, drive, a sincere love of mankind, perseverance and the will and desire to serve; he (she) must have an understanding of children and their problems in their development towards adulthood, and he (she) must know how to handle them and their problems and to assist in satisfying their educational needs.
- The good teacher must have a thorough knowledge of his subject or subjects. There is nothing more pathetic in teaching than the teacher who doesn't know what he is talking about, who teaches the wrong things or teaches things wrongly. The good teacher will move mountains to keep fully abreast of the contents of his subjects.
- The good teacher is one who is thoroughly trained for his job. Bad doctors can harm their patients' bodies, bad lawyers can drive their clients to bankruptcy, but bad teachers harm children in mind and in spirit.
- The good teacher believes in children; never underestimates their abilities and

potential; encourages them to aim high and ever higher and not be satisfied with the minimum; does not bully children, either physically or mentally; does not try to get rid of pupils if they do not progress rapidly enough to assist him in obtaining 'good results'; does not seek merely to further his own interests; is not in a hurry to see the fruits of his labour; never loses courage and hope; knows that his job is not merely an occupation or a profession but a vocation and that the good (or bad) work he does will live on in the hearts and minds of people long after he has passed on.

If requirements such as those above are to be satisfied, it is obvious that teaching is not for just anybody. Our country's human material is too precious for that.

The teacher has the task and shares in the responsibility of helping to lead the child to adulthood and no greater responsibility could be laid on anyone's shoulders. In conjunction with this, learning matter must be presented in such a way that the child can assimilate it. This responsibility rests particularly heavily on the teacher in the primary school who must also inculcate in the child a positive attitude towards and an enjoyment of education. A child's earliest school days largely determine what he is to become, what his attitude in life will be, his future success or failure and whether or not he will be a happy and useful person and citizen.

These days teachers work under very pleasant circumstances. Modern school buildings are spacious, attractive, convenient and equipped with a multitude of modern aids. School halls form part of the equipment of virtually every school, while many schools have swimming pools, fine sports fields and even school buses. The remuneration of teachers compares very favourably with that in other fields for which a similar degree of training is required.

Teachers of physical education usually have the largest share in extramural sporting activities, but all teachers have the opportunity of becoming better acquainted with pupils through the medium of the manifold extramural activities and, in this way, also of contributing towards leading them to normal and balanced adulthood.

There are many educational fields for which candidates can equip themselves and a number of types of schools from which to choose, according to their aptitude and interest. They may choose from e.g. nursery education, primary education, secondary education in the "ordinary schools"; special education provided by the provincial education departments (the teaching of the mentally retarded, behavioural deviates, those with defective hearing and speech and chronically ill pupils attached to hospitals, etc.); special education under the jurisdiction of the Department of National Education (the teaching of the visually handicapped, aurally handicapped, epileptics, those with cerebral palsy and brain injury as well as the physically handicapped), and special education in accordance with the Children's Act (schools of industries and reform schools).

Other branches which the teacher can choose are agricultural education, commercial education, domestic science teaching, technical education (technical schools, technical colleges, technical institutes and colleges for advanced technical education), art education, and so on. Those who have the necessary qualifications and experience and are interested in the training of students, can be considered for positions as lecturers at colleges for advanced technical education, the various types of teacher training colleges and universities.

There are also many occupations outside school-teaching to which teachers with the necessary training and experience can be appointed, for example those connected with the expert auxiliary services instituted by the various education departments, such as the Psychological and Guidance Services, with posts as school psychologists, vocational guidance officers, speech therapists, remedial teachers and so forth.

Teachers usually start off as assistants. Those who are competent and conscientious, who have initiative and the capacity for organization and leadership can, in the course of time, progress to positions such as those of senior assistant, vice-principal, deputy principal and principal. Other professional posts in the various education departments, such as those of subject inspectors, planners and researchers, are also filled from the ranks of the teachers' corps.

The conscientious and successful teacher always remains a student who immerses himself in his work, keeps abreast of changes and reforms particularly in his own subject, and always tries to let the child share in his own wealth of knowledge and wisdom. For this reason, further study is strongly emphasized. Not only is the deepening of subject knowledge desirable, but also the attainment of advanced educational qualifications such as the B.Ed. degree and other degrees and diplomas.

In this era of frenetic scientific and technical development, both formal and formative education are undergoing a reformation, growth and change as regards learning content, methods, procedures and approach. The profession offers bright and dynamic young people manifold and exciting challenges, and they are the kind the teaching profession needs. Education is the one field in which South Africa cannot afford inferiority.

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A P P E N D I C E S

A. USEFUL ADDRESSES

1. COLLEGES FOR ADVANCED TECHNICAL EDUCATION

The Registrar  
Cape College for Advanced Technical  
Education  
P.O. Box 652  
CAPE TOWN  
8000

The Registrar  
Natal College for Advanced Technical  
Education  
P.O. Box 953  
DURBAN  
4000

The Registrar  
Witwatersrand College for Advanced  
Technical Education  
P.O. Box 3293  
JOHANNESBURG  
2000

The Rector  
College for Advanced Technical  
Education  
Private Bag X6011  
PORT ELIZABETH  
6000

The Registrar  
Pretoria College for Advanced  
Technical Education  
420 Church Street East  
PRETORIA  
0002

The Registrar  
Vaal Triangle College for Advanced  
Technical Education  
Private Bag X021  
VANDERBIJLPARK  
1900

2. TECHNICAL COLLEGES (alphabetical according to towns/cities)

Enquiries must be addressed to the Principal.

Technical College  
Private Bag X004  
BENONI  
1500

Free State Technical College  
Private Bag X20542  
BLOEMFONTEIN  
9300

Technical College  
Private Bag  
BOKSBURG  
1460

Technical College  
Private Bag X10  
BRAKPAN  
1540

Technical College  
Private Bag  
CARLETONVILLE  
2500

Technical College  
Private Bag  
CONGELLA  
4013

East London Technical College  
Private Bag X9016  
EAST LONDON  
5200

Technical College  
Private Bag X1030  
GERMISTON  
1400

Technical College  
Private Bag  
HOWARD PLACE  
7450

Joubert Park Technical College  
Private Bag X10  
JOHANNESBURG  
2000

Technical College  
Private Bag X23  
JOHANNESBURG  
2000

Northern Cape Technical College  
Private Bag X5031  
KIMBERLEY  
8300



Technical College  
Private Bag XA13  
KLERKSDORP  
2570

Technical College  
Private Bag X22  
KROONSTAD  
9500

Technical College  
Private Bag X2004  
KRUGERSDORP  
1740

Pietermaritzburg Technical College  
Private Bag X9032  
PIETERMARITZBURG  
3200

Technical College  
Private Bag X6040  
PORT ELIZABETH  
6000

Technical College  
Private Bag X17  
RANDFONTEIN  
1760

Technical College  
Private Bag X2086  
RUSTENBURG  
0300

Technical College  
Private Bag X2009  
SASOLBURG  
9570

Springs Technical College  
Private Bag X21  
SPRINGS  
1560

Technical College  
Private Bag X5012  
STELLENBOSCH  
7600

Technical College  
Private Bag X35  
UITENHAGE  
6230

Vanderbijlpark Technical College  
Private Bag X05  
VANDERBIJLPARK  
1900

Technical College  
Private Bag X035  
VEREENIGING  
1930

O.F.S. Goldfields Technical College  
Private Bag X21  
WELKOM  
9460

Technical College  
Private Bag X7215  
WITBANK  
1035

3. TECHNICAL INSTITUTES (alphabetical according to towns/cities)

Technical Institute  
P.O. Box 156  
AMANZIMTOTI  
4125

Technical Institute  
P.O. Box 138  
BARBERTON  
1300

Technical Institute  
Private Bag X40  
BETHLEHEM  
9700

Technical Institute  
P.O. Box 147  
BRITS  
0250

Technical Institute  
DURNACOL  
3082

Technical Institute  
P.O. Box 376  
ERMELO  
2350

Technical Institute  
P.O. Box 170  
EVANDER  
2280

Technical Institute  
Private Bag X529  
GEORGE  
6530

Technical Institute  
P.O. Box 142  
GRAHAMSTOWN  
6140

Technical Institute  
P.O. Box 159  
KING WILLIAM'S TOWN  
5600

Technical Institute  
P.O. Box 55  
LICHTENBURG  
2740

South Peninsula Technical Institute  
P.O. Box 34  
MUIZENBERG  
7945

Technical Institute  
P.O. Box 820  
NELSPRUIT  
1200

Technical Institute  
Private Bag X135  
NEWCASTLE  
2940

Technical Institute  
P.O. Box 235  
PAARL  
7620

Technical Institute  
P.O. Box 304  
PINETOWN NATAL  
3600

Technical Institute  
P.O. Box 925  
POTCHEFSTROOM  
2520

Educational Institute of the S.A.P.  
POLKOL  
0111

Technical Institute Pretoria-West  
150 Industrial Road  
PRETORIA-WEST  
0183

Technical Institute  
P.O. Box 71  
QUEENSTOWN

Technical Institute  
P.O. Box 253  
VRYHEID  
3100

Kempton Park Technical Institute  
P.O. Box 844  
KEMPTON PARK  
1620

Ladysmith Technical Institute  
Private Bag X903  
LADYSMITH NATAL  
3370

Technical Institute  
P.O. Box 533  
MIDDELBURG TRANSVAAL  
1050

Technical Institute  
Private Bag X50180  
NEW REDRUTH  
1452

Technical Institute  
P.O. Box 205  
PIETERSBURG  
0700

Technical Institute  
Private Bag X829  
PORT SHEPSTONE  
4240

Technical Institute  
P.O. Box 137  
POTGIETERSRUS  
0600

Tygerberg Technical Institute  
Private Bag  
SANLAMHOF CP  
7532

Technical Institute  
P.O. Box 66  
STANDERTON  
2430

Technical Institute  
P.O. Box 128  
STRAND  
7140

Technical Institute  
P.O. Box 192  
TZANEEN  
0850

Technical Institute  
Private Bag X886  
UPINGTON  
8800

Technical Institute  
Private Bag X960  
WORCESTER  
6850

4. GOVERNMENT DEPARTMENTS

Unless otherwise stated enquiries should be addressed to the Secretary. The postal code for Pretoria boxes is 0001.

Department of Agricultural Credit  
and Land Tenure  
Private Bag X118  
PRETORIA

Department of Agricultural Economics  
and Marketing  
Private Bag X250  
PRETORIA

Department of Agricultural Technical  
Services  
Private Bag X116  
PRETORIA

Department of Bantu Administration  
and Development  
P.O. Box 384  
PRETORIA

Department of Bantu Education  
Private Bag X212  
PRETORIA

Department of Community Development  
Private Bag X149  
PRETORIA

Department of Coloured, Rehoboth  
and Nama Relations  
Private Bag X9058  
CAPE TOWN  
8000

Department of Customs and Excise  
Private Bag X47  
PRETORIA

Department of Commerce  
Private Bag X84  
PRETORIA

The Commandant-General of the  
S.A. Defence Force  
Department of Defence  
Private Bag X160  
PRETORIA

The Auditor-General  
Department of the Auditor-General  
P.O. Box 446  
PRETORIA

Department of Finance  
Union Buildings  
PRETORIA  
0002

The Secretary to the Treasury  
Department of Finance  
Private Bag X115  
PRETORIA

Department of Foreign Affairs  
Union Buildings  
PRETORIA  
0002

Department of Forestry  
Private Bag X93  
PRETORIA

Department of Health  
Private Bag X88  
PRETORIA

Department of Immigration  
P.O. Box 2072  
PRETORIA

Department of Indian Affairs  
Private Bag X92  
PRETORIA

Department of Industries  
Private Bag X342  
PRETORIA

Department of Information  
Private Bag X152  
PRETORIA

Department of Inland Revenue  
P.O. Box 402  
PRETORIA

Department of the Interior  
Private Bag X114  
PRETORIA

Department of Justice  
Private Bag X81  
PRETORIA

Department of Labour  
Private Bag X117  
PRETORIA

Department of Mines  
Private Bag X59  
PRETORIA

Department of National Education  
Private Bag X122  
PRETORIA

Department of Planning and the  
Environment  
Private Bag X213  
PRETORIA

Commissioner of Prisons  
Department of Prisons  
Private Bag X136  
PRETORIA

Department of Public Works  
Private Bag X65  
PRETORIA

Department of Statistics  
Private Bag X44  
PRETORIA

Department of Sport and Recreation  
Private Bag X269  
PRETORIA

Department of Tourism  
Private Bag X262  
PRETORIA

Department of Water Affairs  
Private Bag X313  
PRETORIA

Secretary to the Prime Minister  
Department of the Prime Minister  
Union Buildings  
PRETORIA  
0002

Secretary: Public Service Commission  
Office of the Public Service Commis=  
sion  
Private Bag X121  
PRETORIA

Department of Social Welfare and  
Pensions  
Private Bag  
PRETORIA

Commissioner of the South African  
Police  
Department of the South African  
Police  
Private Bag X94  
PRETORIA

Department of Transport  
Private Bag X193  
PRETORIA

#### 5. GOVERNMENT OFFICES

The Director  
Division Sea Fisheries  
Department of Industries  
Coast Road  
SEA POINT  
8001

The Director  
Geological Survey  
Department of Mines  
Private Bag X112  
PRETORIA  
0001

The Director  
Civil Aviation Division  
Department of Transport  
Private Bag X193  
PRETORIA  
0001

The Director  
Weather Bureau Division  
Department of Transport  
Private Bag X193  
PRETORIA  
0001

#### 6. REGIONAL OFFICES OF THE PUBLIC SERVICE COMMISSION

PRETORIA  
315 Northvaal Buildings  
Vermeulen Street  
PRETORIA  
0002  
Tel.: 484722

JOHANNESBURG  
P.O. Box 6371  
1203 Kelhof  
112 Pritchard Street  
JOHANNESBURG  
2000  
Tel.: 22-8143

BLOEMFONTEIN  
P.O. Box 517  
849 H.F. Verwoerd Buildings  
St Andrew Street  
BLOEMFONTEIN  
9300  
Tel.: 71180

KIMBERLEY  
304 Saambou Buildings  
Du Toitspan Road  
KIMBERLEY  
8301  
Tel.: 25612

CAPE TOWN

930 Broadway Buildings  
Heerengracht  
CAPE TOWN  
8001  
Tel.: 228845

DURBAN

507 Esceval House  
437 Smith Street  
DURBAN  
4001  
Tel.: 68829

PORT ELIZABETH

P.O. Box 3192  
59 Eben Dönges Buildings  
Hancock Street  
North End  
PORT ELIZABETH  
6000  
Tel.: 49931

7. PROVINCIAL ADMINISTRATIONS AND THE ADMINISTRATION OF SOUTH-WEST AFRICA

The Provincial Secretary  
Provincial Administration of the  
Cape of Good Hope  
P.O. Box 659  
CAPE TOWN  
8000

The Provincial Secretary  
Provincial Administration of the  
Orange Free State  
P.O. Box 517  
BLOEMFONTEIN  
9300

The Secretary for South-West Africa  
The Administration of South-West  
Africa  
Private Bag X13186  
WINDHOEK  
9100

The Provincial Secretary  
Provincial Administration of Natal  
Private Bag X9037  
PIETERMARITZBURG  
3200

The Provincial Secretary  
Provincial Administration of the  
Transvaal  
Private Bag X64  
PRETORIA  
0001

8. TEACHER TRAINING INSTITUTIONS UNDER THE DEPARTMENT OF NATIONAL EDUCATION

The Principal  
Barkly House Training College for Nursery  
Education  
Private Bag  
CLAREMONT  
7735

The Principal  
Training College for Nursery School  
Teachers  
Private Bag X6  
HILLBROW  
2038

9. PROVINCIAL EDUCATION DEPARTMENTS

The Director of Education  
Department of Education Cape of  
Good Hope  
P.O. Box 13  
CAPE TOWN  
8000

The Director of Education  
OFS Department of Education  
P.O. Box 521  
BLOEMFONTEIN  
9300

The Director of Education  
Natal Education Department  
Private Bag X9044  
PIETERMARITZBURG  
3200

The Director of Education  
Transvaal Education Department  
Private Bag X76  
PRETORIA  
0001

10. PROVINCIAL TEACHER TRAINING COLLEGES

Cape Province

The Rector  
Teachers' College  
Highbury Road  
Mowbray  
CAPE TOWN  
7700

The Rector  
Teachers' College  
P.O. Box 102  
GRAAFF-REINET  
6280

The Rector  
Teachers' College  
Private Bag X649  
OUDTSHOORN  
6620

The Rector  
Teachers' College  
P.O. Box 311  
PAARL  
7620

The Rector  
Teachers' College  
Belmont Terrace  
PORT ELIZABETH  
6001

The Rector  
Denneoord College  
Van Riebeeck Street  
STELLENBOSCH  
7600

The Rector  
Teachers' College  
Van Riebeeck Street  
WELLINGTON  
7655

Natal

The Rector  
Durban Teachers' Training College  
Queen Mary Avenue  
DURBAN  
4001

The Rector  
Natal Teachers' Training College  
P.O. Box 566  
PIETERMARITZBURG  
3200

The Rector  
Edgewood College of Education  
Private Bag X2001  
PINETOWN  
3600

Orange Free State

The Rector  
Teachers' College of the OFS  
Park Road  
BLOEMFONTEIN  
9301

Transvaal

The Rector  
Goudstad College of Education  
Private Bag X2  
Cottesloe  
JOHANNESBURG  
2092

The Rector  
Johannesburg College of Education  
17 Hoofd Street  
BRAAMFONTEIN  
2001

The Rector  
Potchefstroom College of Education  
President Street  
POTCHEFSTROOM  
2520

The Rector  
Pretoria College of Education  
Private Bag X382  
PRETORIA  
0001

11. AGRICULTURAL COLLEGES

The Director : OFS Region  
Department of Agricultural Technical  
Services  
Agricultural Research Station and  
College of Agriculture  
GLEN  
9360

The Director : Natal Region  
Department of Agricultural Technical  
Services  
Cedara College of Agriculture  
Private Bag X9059  
PIETERMARITZBURG  
3200

The Director : Winter Rainfall Region  
Department of Agricultural Technical  
Services  
Elsenburg College of Agriculture  
Private Bag X5023  
STELLENBOSCH  
7600

The Director : Karoo Region  
Department of Agricultural Technical  
Services  
College of Agriculture, Grootfontein  
MIDDELBURG CP  
5900

The Director : Highveld Region  
Department of Agricultural Technical  
Services  
College of Agriculture and Research  
Station  
Private Bag X804  
POTCHEFSTROOM  
2520

12. OTHER BODIES AND ORGANIZATIONS

The President  
Human Sciences Research Council  
Private Bag X41  
PRETORIA  
0001

The Personnel Manager  
Armaments Board  
Private Bag X337  
PRETORIA  
0001

The Personnel Officer  
Atomic Energy Board  
Private Bag X256  
PRETORIA  
0001

The General Manager  
Citizens' Housing League  
P.O. Box 259  
CAPE TOWN  
8000

The Secretary  
Council for Scientific and  
Industrial Research  
P.O. Box 395  
PRETORIA  
0001

The Registrar  
The Dental Mechanics Board  
P.O. Box 995  
PRETORIA  
0001

The Personnel Manager  
AE & CI Limited  
P.O. Box 1122  
JOHANNESBURG  
2000

The Personnel Manager  
Atlas Aircraft Corporation of  
South Africa (Pty) Ltd  
P.O. Box 11  
KEMPTON PARK  
1620

The General Manager  
Chamber of Mines of South Africa  
P.O. Box 809  
JOHANNESBURG  
2000

The Director  
Conservatoire of Music  
Private Bag X316  
PRETORIA  
0001

The Secretary  
Dental Association of South Africa  
Private Bag X1  
HOUGHTON  
2041

The Personnel Manager  
Electricity Supply Commission  
P.O. Box 1091  
JOHANNESBURG  
2000

The Secretary  
Federation of Building Industries  
P.O. Box 11359  
JOHANNESBURG  
2000

The Secretary  
Foundation for Pharmaceutical  
Education  
P.O. Box 31360  
BRAAMFONTEIN  
2017

The Director of Hospital Services  
Natal Department of Hospital Services  
Private Bag X9051  
PIETERMARITZBURG  
3200

The Director of Hospital Services  
Transvaal Department of Hospital Services  
Private Bag X221  
PRETORIA  
0001

The Principal  
Hugonote College of the Ned. Geref. Kerk  
P.O. Box 5  
WELLINGTON  
7655

The Director  
National Institute for Metallurgy  
Private Bag X7  
AUCKLAND PARK  
2006

The Director  
National Parks Board  
P.O. Box 787  
PRETORIA  
0001

The Principal  
Pretoria College of Physiotherapy  
Private Bag X169  
PRETORIA  
0001

The Medical Director  
The South African Blood Transfusion  
Service  
P.O. Box 9326  
JOHANNESBURG  
2000

The Director  
South African Bureau of Standards  
Private Bag X191  
PRETORIA  
0001

The Secretary  
Federation of Societies of  
Professional Engineers  
P.O. Box 61019  
MARSHALLTOWN  
2107

The Director of Hospital Services  
Cape Provincial Hospitals Department  
P.O. Box 2060  
CAPE TOWN  
8000

The Director of Hospital Services  
O.F.S. Division Hospital Services  
P.O. Box 517  
BLOEMFONTEIN  
9300

The Secretary  
The Hotel Board  
P.O. Box 244  
PRETORIA  
0001

The Rector  
Johannesburg College of Art  
Private Bag X15  
JOHANNESBURG  
2000

The Director  
National Institute for Personnel  
Research  
P.O. Box 10319  
JOHANNESBURG  
2000

The Director  
Oceanographic Research Institute  
P.O. Box 736  
DURBAN  
4000

The Secretary  
South African Association of Consulting  
Engineers  
P.O. Box 61019  
MARSHALLTOWN  
2107

The Director : Personnel  
South African Broadcasting Corporation  
P.O. Box 8606  
JOHANNESBURG  
2000

The Design Institute  
SA Bureau of Standards  
Private Bag X191  
PRETORIA  
0001



The Personnel Manager  
South African Coal, Oil and Gas  
Corporation Ltd  
P.O. Box 1  
SASOLBURG  
9570

The Director  
South African Institute for Medical  
Research  
P.O. Box 1038  
JOHANNESBURG  
2000

The Corporative Manager (Personnel)  
South African Iron and Steel  
Industrial Corporation Limited  
P.O. Box 450  
PRETORIA  
0001

The Secretary  
South African Medical Research  
Council  
P.O. Box 70  
TYGERBERG  
7505

The Director  
South African Museum  
P.O. Box 61  
CAPE TOWN  
8000

The Registrar  
South African Nursing Council  
P.O. Box 1123  
PRETORIA  
0001

The Registrar  
South African Pharmacy Board  
P.O. Box 96  
PRETORIA  
0001

The Secretary  
SA Taalbond  
P.O. Box 197  
STELLENBOSCH  
7600

The Deputy Postmaster General  
Telecommunication Head Office  
Post Office  
Private Bag X74  
PRETORIA  
0001

The Director  
Veterinary Research Institute  
ONDERSTEEPOORT  
0110

The President  
South African EEG Society  
P.O. Box 10319  
JOHANNESBURG  
2000

The Secretary: Mr T.D. Burrell  
South African Institute of Patent Agents  
c/o Spoor & Fisher  
P.O. Box 454  
PRETORIA  
0001

The Registrar  
South African Medical and Dental Council  
6115 Oranje-Nassau Building  
P.O. Box 205  
Schoeman Street  
PRETORIA  
0001

The Captain Superintendent  
S.A. Merchant Navy Academy General Botha  
P.O. Box 2880  
CAPE TOWN  
8000

The Secretary  
SA Nursing Association  
P.O. Box 1280  
PRETORIA  
0001

The Secretary  
South African Optometric Association  
P.O. Box 3966  
PRETORIA  
0001

The General Manager  
South African Railways  
Paul Kruger Building  
Wolmarans Street  
JOHANNESBURG  
2001

The Director  
Sugar Milling Research Institute  
University of Natal  
King George V Avenue  
DURBAN  
4001

The General Manager  
Uranium Enrichment Corporation of  
South Africa Limited  
P.O. Box 4587  
PRETORIA  
0001

The Principal  
Vona du Toit College of Occupational  
Therapy  
Private Bag X169  
PRETORIA  
0001

### 13. PROFESSIONAL BODIES

The Actuarial Society of South Africa  
P.O. Box 4464  
CAPE TOWN  
8000

Faculty of Accountants of South Africa  
P.O. Box 287  
CAPE TOWN  
8000

Association of Accredited Practitioners  
in Advertising Ltd  
P.O. Box 8813  
JOHANNESBURG  
2000

Institute of Administration and  
Commerce of South Africa  
P.O. Box 2907  
CAPE TOWN  
8000

Building Societies Institute of Southern  
Africa  
P.O. Box 61883  
MARSHALLTOWN  
2107

Institute of Bankers in South Africa  
P.O. Box 61510  
MARSHALLTOWN  
2107

Institute of Administrators of  
Non-European Affairs  
P.O. Box 1884  
PRETORIA  
0001

Institute of Cost and Management  
Accountants  
P.O. Box 61940  
MARSHALLTOWN  
2107

Institute of Certified Bookkeepers  
of South Africa  
P.O. Box 2237  
CAPE TOWN  
8000

Institute of Marketing Management  
P.O. Box 8377  
JOHANNESBURG  
2000

Institute of Credit Management  
in Southern Africa  
P.O. Box 2074  
DURBAN  
4000

Institute of South African Shipbrokers  
P.O. Box 4325  
CAPE TOWN  
8000

Institute of Personnel Management  
(Southern Africa)  
P.O. Box 31390  
BRAAMFONTEIN  
2017

Insurance Institute of South Africa  
P.O. Box 61837  
MARSHALLTOWN  
2107

Institute of Traffic Officers of  
Southern Africa  
P.O. Box 113  
POTCHEFSTROOM  
2520

Public Relations Institute of  
South Africa  
P.O. Box 31390  
BRAAMFONTEIN  
2017

National Occupational Safety  
Association  
P.O. Box 26434  
Arcadia  
PRETORIA  
0007

South African Association of  
Business Management  
P.O. Box 2502  
PRETORIA  
0001

South African Association of Certified  
Secretaries  
P.O. Box 2624  
CAPE TOWN  
8000

South African Institute of  
Management  
P.O. Box 56222  
PINEGOWRIE  
2123

South African Institute of Organization  
and Methods  
P.O. Box 693  
PRETORIA  
0001

South African Institute of Printing  
P.O. Box 2775  
CAPE TOWN  
8000

South African Institute of  
Supervisory Management  
P.O. Box 2547  
JOHANNESBURG  
2000

South African Institute of Valuers  
P.O. Box 7598  
JOHANNESBURG  
2000

The Southern African Institute of  
Chartered Secretaries and  
Administrators  
P.O. Box 1917  
JOHANNESBURG  
2000

#### 14. CORRESPONDENCE COLLEGES

Information concerning correspondence colleges may also be obtained from the  
Correspondence College Council, P.O. Box 1331, Johannesburg 2000.

Actuarial Tuition Service  
c/o Actuarial Society of S.A.  
P.O. Box 4464  
CAPE TOWN  
8000

African United Colleges  
P.O. Box 2115  
PRETORIA  
0001

Aviation College of South Africa  
P.O. Box 6701  
JOHANNESBURG  
2000

Britzius Correspondence College  
P.O. Box 5482  
JOHANNESBURG  
2000

Canyon Academy of South Africa  
P.O. Box 52060  
SAXONWOLD  
2132

Cleaver-Hume College (Pty) Ltd  
P.O. Box 8417  
JOHANNESBURG  
2000

College of Accountancy  
P.O. Box 31125  
BRAAMFONTEIN  
2017

College of Commerce  
Private Bag  
MOWBRAY  
7705

Damelin Institute of Professional  
Studies (Pty) Ltd  
P.O. Box 4129  
JOHANNESBURG  
2000

Dun & Bradstreet (Pty) Ltd  
P.O. Box 5166  
JOHANNESBURG  
2000

Exclusive Interiors International  
P.O. Box 11115  
CAPE TOWN  
8000

The Good Samaritan School  
P.O. Box 37174  
BIRNAM PARK  
2015

Harvard College P.O. Box 7487 JOHANNESBURG 2000	Insurance Institute of S.A. P.O. Box 61837 MARSHALLTOWN 2107
Institute of Building P.O. Box 10524 JOHANNESBURG 2000	Institute of Personnel Management P.O. Box 31390 BRAAMFONTEIN 2017
Institute for Industrial Education P.O. Box 2103 DURBAN 4000	International Correspondence Schools (Overseas) Ltd P.O. Box 19 CAPE TOWN 8000
Jannie Raath Kollege (Edms) Beperk P.O. Box 1175 PRETORIA 0001	Libertas Correspondence College P.O. Box 2782 PRETORIA 0001
Lyceum Correspondence College (Pty) Ltd P.O. Box 1103 JOHANNESBURG 2000	Management Education (Pty) Ltd P.O. Box 5631 JOHANNESBURG 2000
Maranata Teologiese Kollege P.O. Box 2708 PRETORIA 0001	Melody School of Music (Pty) Ltd P.O. Box 5312 JOHANNESBURG 2000
Milwaukee School of Watchmaking P.O. Box 1622 PRETORIA 0001	National School of Salesmanship (Pty) Ltd P.O. Box 3235 JOHANNESBURG 2000
Rapid Results College P.O. Box 1809 DURBAN 4000	Radiokom (1969) (Pty) Ltd P.O. Box 56310 PINEGOWRIE 2123
Rhodes International 47 Hope Street CAPE TOWN 8000	Skryfhuis P.O. Box 538 FLORIDA 1710
School of Accountancy P.O. Box 2918 CAPE TOWN 8000	Sukses Korrespondensiekollege P.O. Box 8737 JOHANNESBURG 2000
S.A. Faculty of Homoeopathic Medicines P.O. Box 6071 JOHANNESBURG 2000	S.A. Institute of Mind Training (Oom-lasie) P.O. Box 207 STRAND 7140
S.A. National School of Electronics P.O. Box 9766 JOHANNESBURG 2000	S.A. Tegniiese Instituut P.O. Box 134 BELLVILLE 7530

S.A. College of Engineering Designers  
& Draughtsmen  
P.O. Box 53  
JOHANNESBURG  
2000

South African School of Film  
Technique (Pty) Ltd  
P.O. Box 91  
GONUBIE  
5256

South African Institute for Technical  
and Commercial Studies  
P.O. Box 37  
THOKOZA  
ALBERTON  
1450

Transafrika Correspondence College  
(Pty) Ltd  
P.O. Box 3512  
JOHANNESBURG  
2000

Turret Correspondence College (Pty) Ltd  
P.O. Box 11350  
JOHANNESBURG  
2000

Union College (Pty) Ltd  
P.O. Box 3541  
JOHANNESBURG  
2000

Universal Institute  
470 Van der Hoff Road  
Hercules  
PRETORIA  
0082

Veasey's Engineering College  
P.O. Box 35  
JOHANNESBURG  
2000

Veritas Kollege vir Beroepsleiding  
P.O. Box 1066  
BLOEMFONTEIN  
9300

Willard Trust  
P.O. Box 2040  
BLOEMFONTEIN  
9300

World Correspondence College  
(Pty) Ltd  
P.O. Box 924  
PRETORIA  
0001

## 15. UNIVERSITIES

The Registrar  
University of Cape Town  
Private Bag  
RONDEBOSCH  
7700

The Registrar  
University of Natal  
King George V Avenue  
DURBAN  
4001

The Registrar  
University of Natal  
P.O. Box 375  
PIETERMARITZBURG  
3200

The Registrar  
University of the Orange Free State  
P.O. Box 339  
BLOEMFONTEIN  
9300

The Registrar  
University of Port Elizabeth  
P.O. Box 1600  
PORT ELIZABETH  
6000

The Registrar  
Potchefstroom University for Christian  
Higher Education  
POTCHEFSTROOM  
2520

The Registrar (Academic)  
University of Pretoria  
Brooklyn  
PRETORIA  
0181

The Registrar  
Rand Afrikaans University  
P.O. Box 524  
JOHANNESBURG  
2000

The Registrar  
Rhodes University  
P.O. Box 94  
GRAHAMSTOWN  
6140

The Registrar  
University of South Africa  
P.O. Box 392  
PRETORIA  
0001

The Registrar  
University of Stellenbosch  
STELLENBOSCH  
7600

The Registrar  
University of the Witwatersrand  
Jan Smuts Avenue  
JOHANNESBURG  
2001

B. TRAINING CENTRES FOR NURSES

1. Training centres for the Diploma for Registration as a General Nurse

Addington Hospital	P.O. Box 977, Durban 4000
Andrew McColm Hospital	Private Bag X307, Pretoria 0001
Barberton Hospital	Private Bag X617, Barberton 1300
Bethlehem Hospital	Bethlehem 9700
Boksburg-Benoni Hospital	Private Bag, Boksburg 1460
Conradie Hospital	Howard Place, Cape Town 7450
Discoverers' Memorial Hospital	P.O. Box 4, Florida 1710
Eben Dönges Hospital	Private Bag X958, Worcester 6850
Edenvale Hospital	Private Bag X1005, Edenvale 1610
Entabeni Hospital	P.O. Box 2230, Durban 4000
Ermelo Hospital	Private Bag X5, Ermelo 2350
Far East Rand Hospital	P.O. Box 5, New State Areas, Springs 1564
Frere Hospital	Private Bag, East London 5200
Frontier Hospital	P.O. Box 107, Queenstown 5320
Germiston Hospital	Private Bag X1035, Germiston 1400
Grey Hospital	Private Bag X443, King William's Town 5600
Grey's Hospital	Private Bag X9001, Pietermaritzburg 3200
Groote Schuur Hospital	Observatory, Cape Town 7925
H.F. Verwoerd Hospital	P.O. Box 437, Pretoria 0001
J.G. Strydom Hospital	Private Bag X1, Auckland Park, Johannesburg 2006
Johannesburg Hospital	Smit Street, Johannesburg 2001
Karl Bremer Hospital	Bellville 7530
Kimberley Hospital	P.O. Box 618, Kimberley 8300
Klerksdorp Hospital	Private Bag, Klerksdorp 2570
Krugersdorp Hospital	Private Bag X2006, Krugersdorp 1740
Middelburg Hospital	Private Bag X812, Middelburg 1050
Midland Hospital	P.O. Box 33, Graaff-Reinet 6280
National Hospital	Private Bag X0598, Bloemfontein 9300
Niç Bodenstein Hospital	Private Bag, Wolmaransstad 2630
No. 1 Military Hospital	Voortrekkerhoogte 0187

Oudtshoorn Hospital	Oudtshoorn 6620
Paarl Hospital	Private Bag, Paarl 7620
Paul Kruger Memorial Hospital	Private Bag X82079, Rustenburg 0300
Pietersburg Hospital	Private Bag X9316, Pietersburg 0700
Potchefstroom Hospital	Private Bag X938, Potchefstroom 2520
Provincial Hospital	Private Bag X6035, Port Elizabeth 6000
Provincial Hospital	Private Bag, Uitenhage 6230
Rondebosch-Mowbray Hospital	46 Sawkins Road, Rosebank, Cape Town 7700
St Augustine's Hospital	107 Chelmsford Road, Durban 4001
Settlers Hospital	Private Bag, Grahamstown 6140
Somerset Hospital	Private Bag, Green Point 8051
South Rand Hospital	Private Bag, Rosettenville, Johannesburg 2130
Standerton Hospital	Private Bag, Standerton 2430
State Hospital	Windhoek 9100
Swartland Hospital	Malmesbury 7300
Tygerberg Hospital	Private Bag, Tiervlei, Parowvallei 7503
Vanderbijlpark Hospital	Private Bag X023, Vanderbijlpark 1900
Vereeniging Hospital	Private Bag X031, Vereeniging 1930
Victoria Hospital	Alphen Hill, Wynberg, Cape Town 7800
Volkshospitaal	Hof Street, Oranjezicht, Cape Town 8001
Voortrekker Hospital	Private Bag, Kroonstad 9500
Welkom Provincial Hospital	Welkom 9460
Witbank Hospital	Private Bag, Witbank 1035
Woodstock Hospital	Mountain Road, Woodstock, Cape Town 7925

2. Training centres for the Diploma as a General Nurse and Midwife

Addington Hospital	P.O. Box 977, Durban 4000
Andrew McColm Hospital	Private Bag X307, Pretoria 0001
Barberton Hospital	Private Bag X617, Barberton 1300
Bethlehem Hospital	Bethlehem 9700
Boksburg-Benoni Hospital	Private Bag, Boksburg 1460
Conradie Hospital	Howard Place, Cape Town 7450
Discoverers' Memorial Hospital	P.O. Box 4, Florida 1710
Eben Dönges Hospital	Private Bag X958, Worcester 6850
Ermelo Hospital	Private Bag X5, Ermelo 2350
Far East Rand Hospital	P.O. Box 5, New State Areas, Springs 1564
Frere Hospital	Private Bag X9047, East London 5200
Frontier Hospital	P.O. Box 107, Queenstown 5320
Germiston Hospital	Private Bag X1035, Germiston 1400
Groote Schuur Hospital	Observatory, Cape 7925
H.F. Verwoerd Hospital	P.O. Box 437, Pretoria 0001
J.G. Strydom Hospital	Private Bag X1, Auckland Park, Johannesburg 2006

Johannesburg Hospital	Smit Street, Johannesburg 2001
Kimberley Hospital	P.O. Box 618, Kimberley 8300
Klerksdorp Hospital	Private Bag, Klerksdorp 2570
Krugersdorp Hospital	Private Bag X2006, Krugersdorp 1740
Middelburg Hospital	Private Bag X812, Middelburg 1050
Oudtshoorn Hospital	Oudtshoorn 6620
Paarl Hospital	Private Bag, Paarl 7620
Paul Kruger Memorial Hospital	Private Bag X82079, Rustenburg 0300
Pietersburg Hospital	Private Bag X9316, Pietersburg 0700
Potchefstroom Hospital	Private Bag X938, Potchefstroom 2520
Provincial Hospital	Private Bag X6035, Port Elizabeth 6000
Provincial Hospital	Private Bag, Uitenhage, 6230
Rondebosch & Mowbray Hospital	46 Sawkins Road, Rosebank, Cape Town 7700
Settlers & Prince Alfred Hospital	Private Bag X1007, Grahamstown 6140
Somerset Hospital	Private Bag, Green Point 8051
South Rand Hospital	Private Bag, Rosettenville, Johannesburg 2130
Standerton Hospital	Private Bag, Standerton 2430
State Hospital	Private Bag X13215, Windhoek 9100
Swartland Hospital	Malmesbury 7300
Tygerberg Hospital	Private Bag, Tiervlei, Parowvallei 7503
Vanderbijlpark Hospital	Private Bag X023, Vanderbijlpark 1900
Vereeniging Hospital	Private Bag X031, Vereeniging 1930
Victoria Hospital	Plumstead, Cape 7800
Volks Hospital	Hof Street, Oranjezicht, Cape 8001
Voortrekker Hospital	Private Bag, Kroonstad 9500
Welkom Provincial Hospital	Welkom 9460
Witbank Hospital	Private Bag, Witbank 1035
Woodstock Hospital	Mountain Road, Woodstock, Cape Town 7925

3. Training centres for the Diploma for Registration as a Psychiatric Nurse

Fort Napier Psychiatric Training School	P.O. Box 370, Pietermaritzburg 3200
Groote Schuur Hospital (Only registered general nurses)	Observatory, Cape Town 7925
Komani Hospital	P.O. Box 171, Queenstown 5320
Oranje Hospital	Bloemfontein 9301
Sterkfontein Hospital	P.O. Box 323, Krugersdorp 1740
Tara Hospital	Private Bag X7, Randburg 2125
Valkenberg Hospital	Observatory, Cape Town 7925
Weskoppies Hospital	Pretoria 0002
Western Cape Training School for Psychiatric Nurses	Stikland Hospital, Bellville 7530



Johannesburg Hospital	Smit Street, Johannesburg 2001
Kimberley Hospital	P.O. Box 618, Kimberley 8300
Klerksdorp Hospital	Private Bag, Klerksdorp 2570
Krugersdorp Hospital	Private Bag X2006, Krugersdorp 1740
Middelburg Hospital	Private Bag X812, Middelburg 1050
Oudtshoorn Hospital	Oudtshoorn 6620
Paarl Hospital	Private Bag, Paarl 7620
Paul Kruger Memorial Hospital	Private Bag X82079, Rustenburg 0300
Pietersburg Hospital	Private Bag X9316, Pietersburg 0700
Potchefstroom Hospital	Private Bag X938, Potchefstroom 2520
Provincial Hospital	Private Bag X6035, Port Elizabeth 6000
Provincial Hospital	Private Bag, Uitenhage, 6230
Rondebosch & Mowbray Hospital	46 Sawkins Road, Rosebank, Cape Town 7700
Settlers & Prince Alfred Hospital	Private Bag X1007, Grahamstown 6140
Somerset Hospital	Private Bag, Green Point 8051
South Rand Hospital	Private Bag, Rosettenville, Johannesburg 2130
Standerton Hospital	Private Bag, Standerton 2430
State Hospital	Private Bag X13215, Windhoek 9100
Swartland Hospital	Malmesbury 7300
Tygerberg Hospital	Private Bag, Tiervlei, Parowvallei 7503
Vanderbijlpark Hospital	Private Bag X023, Vanderbijlpark 1900
Vereeniging Hospital	Private Bag X031, Vereeniging 1930
Victoria Hospital	Plumstead, Cape 7800
Volks Hospital	Hof Street, Oranjezicht, Cape 8001
Voortrekker Hospital	Private Bag, Kroonstad 9500
Welkom Provincial Hospital	Welkom 9460
Witbank Hospital	Private Bag, Witbank 1035
Woodstock Hospital	Mountain Road, Woodstock, Cape Town 7925

3. Training centres for the Diploma for Registration as a Psychiatric Nurse

Fort Napier Psychiatric Training School	P.O. Box 370, Pietermaritzburg 3200
Groote Schuur Hospital (Only registered general nurses)	Observatory, Cape Town 7925
Komani Hospital	P.O. Box 171, Queenstown 5320
Oranje Hospital	Bloemfontein 9301
Sterkfontein Hospital	P.O. Box 323, Krugersdorp 1740
Tara Hospital	Private Bag X7, Randburg 2125
Valkenberg Hospital	Observatory, Cape Town 7925
Weskoppies Hospital	Pretoria 0002
Western Cape Training School for Psychiatric Nurses	Stikland Hospital, Bellville 7530

4. Training centres for the Diploma for Registration as a Midwife

Addington Hospital	P.O. Box 977, Durban 4000
Barberton Hospital	Private Bag X617, Barberton 1300
Bethlehem Hospital	Bethlehem 9700
Boksburg-Benoni Hospital	Private Bag, Boksburg 1460
Far East Rand Hospital	P.O. Box 5, New State Areas, Springs 1564
Frere Hospital	Private Bag X9047, East London 5200
Frontier Hospital	P.O. Box 107, Queenstown 5320
Germiston Hospital	Private Bag X1035, Germiston 1400
Grey's Hospital	Private Bag X9001, Pietermaritzburg 3200
Groote Schuur Maternity Block	Observatory, Cape 7925
H.F. Verwoerd Hospital (Maternity Section)	Private Bag X169, Pretoria 0001
Karl Bremer Hospital	Bellville 7530
Kimberley Hospital	P.O. Box 618, Kimberley 8300
Klerksdorp Hospital	Private Bag, Klerksdorp 2570
Krugersdorp Hospital	Private Bag X2006, Krugersdorp 1740
Mater Dei Private Hospital	45 St. Mark's Road, East London 5201
Middelburg Hospital	Private Bag X812, Middelburg 1050
Mothers' Hospital	P.O. Box 2996, Durban 4000
Mowbray Maternity Hospital	Mowbray, Cape 7700
National Hospital	Private Bag X0598, Bloemfontein 9300
No. 1 Military Hospital	Voortrekkerhoogte 0187
Paul Kruger Memorial Hospital	Private Bag X82079, Rustenburg 0300
Pietersburg Hospital	Private Bag X9316, Pietersburg 0700
Potchefstroom Hospital	Private Bag X938, Potchefstroom 2520
Provincial Hospital	Private Bag X6035, Port Elizabeth 6000
Queen Victoria Maternity Hospital	Milner Park, Johannesburg 2001
Rob Ferreira Hospital	Private Bag X11223, Nelspruit 1200
South Rand Hospital	Private Bag, Rosettenville, Johannesburg 2130
State Hospital	Windhoek 9100
Tygerberg Hospital	Private Bag, Tiervlei, Parowvallei 7503
Vereeniging Hospital	Private Bag X031, Vereeniging 1930
Voortrekker Hospital	Private Bag, Kroonstad 9500
Welkom Prov. Hospital	Welkom 9460
Witbank Hospital	Private Bag, Witbank 1035

### C. LIST OF ABBREVIATIONS

AE and CI	African Explosives and Chemical Industries Limited
AEB	Atomic Energy Board
CSIR	Council for Scientific and Industrial Research
Escom	Electricity Supply Commission
ISCOR	South African Iron and Steel Industrial Corporation Limited
SABC	South African Broadcasting Corporation
SABS	South African Bureau of Standards
SACPE	South African Council for Professional Engineers
SANAE	South African National Antarctic Expedition
SASOL	South African Coal, Oil and Gas Corporation Limited
UCOR	Uranium Enrichment Corporation of South Africa Limited

### D. BIBLIOGRAPHY

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- IN-25 STIMIE, C.M., COETZEE, C.J.S. and GEGGUS, C. University training and career possibilities/Universiteitsopleiding en beroepsmoontlikhede. 1975.
- MM-34 TERBLANCHE, S.S. Tegnici in die Republiek van Suid-Afrika. 1972.

#### OTHER PUBLICATIONS

SOUTH AFRICA (Republic). Public Service Commission. Careers in Government Departments 1976-1977. Pretoria, Government Printer, 1976.

SOUTH AFRICA (Republic). Department of Labour. Mv Career/Mv Loopbaan. Johannesburg, Voortrekkerpers. (Quarterly on vocational information.)

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DIRECTORY of Scientific Research Organizations in South Africa. 1975.

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BROCHURES, pamphlets etc., as well as direct information made available by government departments, colleges for advanced technical education and private bodies.

YEARBOOKS of universities 1976.

RGN-PUBLIKASIES SEDERT 1 JANUARIE 1976  
HSRC PUBLICATIONS SINCE 1 JANUARY 1976

'n Volledige lys van RGN-publikasies is op aanvraag verkrygbaar. Eksemplare van publikasies wat uit druk is, kan deur biblioteekdienste verkry word.

A complete list of HSRC publications is available on request. Copies of publications which are out of print can be obtained through library services.

#### GESKIEDENIS/HISTORY

CHURCHOUSE, G. Genealogy Publication No. 4. The Reverend Francis McClelland, Colonial Chaplain to Port Elizabeth 1825-1853. A family history. 1976. R6,65.

ELOFF, C. Bronnepublikasie No. 4. Oorlogsdagboek van H.S. Oosterhagen. 1976. R3,35.

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HUMANITAS - Vol. 4 No. 4. Journal for research in the human sciences. 1976. R6,75.

JAARVERSLAG - Verskyn jaarliks. Gratis.  
ANNUAL REPORT - Published once a year. Gratis.

IN-26 GEGGUS, C. Toekennings beskikbaar vir voorgraadse studie aan Suid-Afrikaanse universiteite vir Blankes. RGN-Voorligtingsreeks UR-7. 1976. R3,50.

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#### KOMMUNIKASIE/COMMUNICATION

KOMM-8 SNYMAN, N. Die verband tussen persoonlikheidsbehoefte en die voorkeur vir onderwerpe uit die massamedia. 1976. R8,45.

#### MANNEKRAG/MANPOWER

MM-57 BOSHOFF, F. Raming van die Newcastlegebied se ekonomiese bedrywige en totale bevolking volgens beroepsgroep vir 1980. 1976. R1,15.

MM-58 WOLMARANS, C.P. Die arbeidsituasie en werkgesindheid van die Kleurlingman in die Kaapse Skiereiland. 1976. R3,20.

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MM-60 DE KLERK, C. The profitability of occupations pursued by highly qualified persons. 1976. R1,35.

MM-61 REDELINGHUYS, H.J. en TERBLANCHE, S.S. Arbeidsomset en afwesigheid in gedensentraliseerde gebiede. 1976. R2,25.

MM-62 SMIT, P.C. Die ingenieurspotensiaal by leerlingingenieurstechnici. 1976. R1,75.

MM-63 VERMAAK, J.A. Die vermenigvuldigerseffek van werkgeleentheidskepping vir die inwoners van Temba. 1976. R2,10.

## Talentopname/Talent Survey

- MT-33 COETZEE, C.J.S. Handelonderwys vir meisies : 'n Empiriese ondersoek. 1976. R2,80.
- MT-34 BOTES, W.L. Wiskundige begaafdheid : 'n Empiriese ondersoek. 1976. R2,05.
- MT-35 DU PREEZ, J.J. Geskrewetaalmoeilikhede by leerlinge in die sekondêre skool. 1976. R1,60
- MT-36 ROOS, W.L. Projek Talentopname : Navorsingsbevindings - 1975. 1976. R0,65.
- MT-36 ROOS, W.L. Project Talent Survey : Research Findings - 1975. 1976. R0,65.
- MT-37 LAUBSCHER, D.B. Onderprestasie gedurende die sekondêre skoolfase. 1976. R1,35.

## NAVORSINGSBULLETIN/RESEARCH BULLETIN

NAVORSINGSBULLETIN - Verskyn tien keer per jaar.  
RESEARCH BULLETIN - Ten issues per annum.

RSA 2000 - Gesprek met die toekomst. Verskyn twee keer per jaar.  
RSA 2000 - Dialogue with the future. Two issues per annum.

Kwic-index van Afgehandelde Navorsing 1969-1974. 1976.  
Kwic-index of Completed Research 1969-1974. 1976.

## OPVOEDKUNDE/EDUCATION

- O-21 Verslag van die Komitee vir Gedifferensieerde Onderwys en Voorligting insake 'n tot nasionale onderwysstelsel vir leerlinge met gestremdhede op pre-primêre, primêre
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