
GENERAL NOTICE

NOTICE 380 OF 2014

DEPARTMENT OF HIGHER EDUCATION AND TRAINING

CALL FOR COMMENTS ON THE NATIONAL SCARCE SKILLS LIST: TOP 100 OCCUPATIONS IN DEMAND

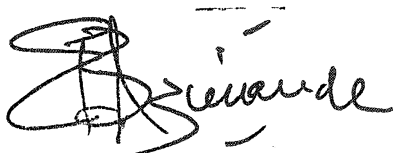
I, Bonginkosi Emmanuel Nzimande, MP, Minister of Higher Education and Training, hereby publish the *National Scarce Skills List: Top 100 Occupations in Demand* for comment.

All interested persons and organisations are invited to comment on the *National Scarce Skills List: Top 100 Occupations in Demand*, in writing, to:

The Director-General, Private Bag X 174, Pretoria, 0001, for attention:
Ms Mmaphake Ramasodi, Telephone: 012 312 5345, Email ramasodi.m@dhet.gov.za,
Fax: 012 323 0991.

Kindly provide the name, address, telephone number, fax number and email address of the person or organisation submitting comments.

Comments must be submitted not later than **20 June 2014**.



DR BE NZIMANDE, MP
MINISTER OF HIGHER EDUCATION AND TRAINING

DATE: 24/04/2014

NATIONAL SCARCE SKILLS LIST: TOP 100 OCCUPATIONS IN DEMAND



Draft for public comment.



**higher education
& training**

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

ABBREVIATIONS

DHA	Department of Home Affairs
DHET	Department of Higher Education and Training
DPRU	Development Policy Research Unit
DoL	Department of Labour
EDD	Department of Economic Development
HRD	Human Resource Development
HRDCSA	Human Resource Development Council of South Africa
HSRC	Human Sciences Research Council
IPAP	Industrial Policy Action Plan
JIPSA	Joint Initiative on Priority Skills Acquisition
JOUR	Job Opportunities and Unemployment Report
NDP	National Development Plan
NGP	New Growth Path
NSDS	National Skills Development Strategy
SETA	Sector Education and Training Authority
SIPs	Strategic Integrated Projects
SSP	Sector Skills Plan
TTT	Technical Task Team
OFO	Organising Framework of Occupations

CONTENTS

1. INTRODUCTION	4
2. PURPOSE.....	4
3. LIFESPAN OF LIST	5
4. KEY CONCEPTS.....	5
5. UTILITY OF NATIONAL SCARCE SKILLS LIST	6
6. PROCESSES FOLLOWED IN COMPILING THE NATIONAL LIST OF SCARCE SKILLS	7
7. INFORMATION SOURCES	8
8. CONSULTATIONS	9
9. KEY FINDINGS	9
10. RANKING SCORECARD FOR NATIONAL SCARCE SKILLS LIST (2014)	13
11. NATIONAL SCARCE SKILLS LIST (2014).....	14
REFERENCES	17
ANNEXURE A: CLUSTER OF OCCUPATIONS.....	18

1. INTRODUCTION

- 1.1 The *White Paper for Post-School Education and Training* (DHET, November 2013) asserts that “if the provision of education and training is to be better coordinated with the needs of society and the economy, central information about skills needs is required”. Therefore “identifying current and future skills demand as accurately as possible is extremely important if the goals of the National Development Plan, the New Growth Path and the Industrial Policy Action Plan are to be achieved”.
- 1.2 The *White Paper* (DHET, November 2013) notes further that the identification of skills needs can be used to inform human resource planning, funding allocations, programme development, and immigration strategies.
- 1.3 The *Human Resource Development Strategy of South Africa (HRDSA) 2010 – 2030* (RSA, 2009), emphasises the need for a national “scarce skills list” which is aligned to South Africa’s social and economic priority goals.
- 1.4 The *Immigration Amendment Act of 2011 (RSA, 2011)* compels the Minister of Home Affairs to compile a “critical skills list” to facilitate the issuing of work visas. The Department of Home Affairs could draw on the national “scarce skills list” to compile its own critical skills list.
- 1.5 Numerous reports have drawn attention to the problems experienced by Government, as well as the private sector, in implementing planned growth strategies, fast-tracking service delivery and producing high quality products and services owing to a lack of skilled people.
- 1.6 It is evident from the above that information about scarce skills is of vital importance for a variety of reasons. These imperatives have necessitated the Minister of Higher Education and Training to produce this National Scarce Skills List.

2. PURPOSE

- 2.1 This document provides a list of the top 100 occupations in the country that are considered to be in short supply, accompanied by an explanation of the methods and processes followed in compiling the list.
- 2.2 The purpose of the list is to inform, inter alia: human resource planning and development; resource allocation and prioritisation; the development of relevant qualifications, programmes and curricula; and international recruitment strategies.

3. LIFESPAN OF LIST

- 3.1 The National Scarce Skills List will be reviewed every 2 years, unless the Minister of Higher Education and Training deems it necessary to review the list earlier.
- 3.2 The formulation of the National Scarce Skills List should be viewed as a dynamic process that is subject to further continuous iterations and methodological improvements based on substantive proposals from the public.

4. KEY CONCEPTS

The following concepts are used in this Notice:

- 4.1 **SCARCE SKILLS** refer to those *occupations* in which there are a scarcity of qualified and experienced people, currently or anticipated in the future, either (a) because such skilled people are not available or (b) they are available but do not meet employment criteria. This scarcity can arise from one or a combination of the following, grouped as relative or absolute:

- a) **Absolute scarcity:** suitably skilled people are not available, for example:

A new or emerging occupation, where there are few, if any, people in the country with the requisite skills (qualification and experience) and where education and training providers have yet to develop learning programmes to meet the skills requirements. In this instance, firms, sectors and even the country are unable to implement planned growth strategies and are experiencing productivity, service delivery and quality problems directly attributable to a lack of skilled people.

Replacement demand would reflect an absolute scarcity where there are no people enrolled or engaged in the process of acquiring the skills that need to be replaced.

- b) **Relative scarcity:** suitably skilled people are available but do not meet other employment criteria, such as:

Geographical location, where there are qualified people, but they are unwilling to work outside of urban areas.

Equity considerations, where there are few, if any, candidates with the requisite skills (qualifications and experience) from specific groups available to meet the skills requirements of firms and enterprises.

Replacement demand would reflect a relative scarcity if there are people in education and training (formal and work-place) who are in the process of acquiring the necessary skills (qualification and experience) but where the lead time will mean that they are not available in the short term to meet replacement demand.

4.2 **OCCUPATION** refers to a set of jobs or specialisations whose main tasks are characterised by such a high degree of similarity that they can be grouped together for the purposes of classification. The *occupations* identified in the *Organising Framework of Occupations (OFO)* therefore represent a category that could encompass a number of jobs or specialisations, e.g. the occupation “General Accountant” would also cover the specialisations “Financial Analyst” and “Insolvency Practitioner”. Occupations are classified according to two main criteria: (a) **skill level** and (b) **skill specialisation**, where skill is used in the context of competency rather than a description of tasks or functions.

4.3 **SKILL** is defined as “the necessary competencies that can be expertly applied in a particular context for a defined purpose” and “competence” has three elements:

- a) **Practical competence** – the ability to perform a set of tasks;
- b) **Foundational competence** – the ability to understand what we ourselves or others are doing and why; and
- c) **Reflexive competence** – the ability to integrate or connect our performance with an understanding of the performance of others, so that we can learn from our actions and are able to adapt to changes and unforeseen circumstances.

4.4 **ORGANISING FRAMEWORK OF OCCUPATIONS** is a skill-based coded classification system, which encompasses all occupations in the South African context. The classification of occupations is based on a combination of **skill level** and **skill specialisation** which makes it easy to locate a specific occupation within the framework.

4.5 **JOB** refers to a set of tasks and duties carried out or meant to be carried out, by one person for a particular employer, including self-employment.

5. UTILITY OF NATIONAL SCARCE SKILLS LIST

The National Scarce Skills List can be used to support decision-making with respect to:

- supply-side planning undertaken by public and private education and training institutions (Universities, Further Education and Training Colleges and Adult Education and Training Centres);

- the development of labour market-relevant programmes and qualifications;
- the determination of funding norms for the programme-qualification mix;
- prioritising student funding through institutions such as the National Student Financial Aid Scheme;
- the identification of skills programmes that are facilitated by Sector Education and Training Authorities (SETAs) and to inform SETA support for bursaries, internships, learnerships and artisan training;
- the identification of training programmes offered by private providers and parastatals;
- career advisory services;
- sector, industry, regional and employer plans; and
- immigration policies (namely, the issuing of work visas).

6. PROCESSES FOLLOWED IN COMPILING THE NATIONAL LIST OF SCARCE SKILLS

The processes followed in compiling the National Scarce Skills List is as follows:

STEP ONE	Agreement on terms of reference for the compilation of National Scarce Skills List.
STEP TWO	Formation of an Advisory Committee to provide inputs to the research.
STEP THREE	Conduct the research.
STEP FOUR	Interviews with a sample of employer association representatives.
STEP FIVE	Presentation of draft findings to the Advisory Committee for feedback.
STEP SIX	Review and revision of feedback from Advisory Committee.
STEP SEVEN	Gazetting of National Scarce Skills List (2014) for public comment.
STEP EIGHT	Review of public comments and revision of National Scarce Skills List (2014).
STEP NINE	Publication of National Scarce Skills List (2014).
STEP TEN	Dissemination of final National Scarce Skills List (2014) to public.

7. INFORMATION SOURCES

The following sources of information were used in the compilation of the National Scarce Skills List:

- 7.1 Report of the Joint Initiative on Priority Skills Acquisition (JIPSA) published by the Presidency in March 2010.
- 7.2 The Scarce and Pivotal Skills Lists (2013/2014) compiled by SETAs.
- 7.3 The Scarce Skills List compiled by the Strategic Integrated Projects (SIPs) (2013/2014) compiled by the Department of Higher Education and Training (DHET), in August 2013.
- 7.4 The New Growth Path (2010) produced by the Department of Economic Development.
- 7.5 The Industrial Policy Action Plan 2 2012/13 – 2014/15 (2012) produced by the Department of Trade and Industry.
- 7.6 The National Development Plan (2012) produced by the National Planning Commission.
- 7.7 The Human Resource Development Strategy for South Africa (2010) produced by the Human Resource Development Council of South Africa (HRDCSA).
- 7.8 A report, Job Opportunities and Unemployment in the South African Labour Market 2011-2012 (2013) produced by the Department of Labour.
- 7.9 Research Paper: Key issues in improving the quantity and quality of professionals in South Africa produced by the HRDCSA (2012).
- 7.10 Research Paper: Occupational shifts and shortages: skills challenges facing the South African economy (2013) produced by the Development Policy Research Unit (DPRU).
- 7.11 Research Paper: Growth, employment and skills: the New Growth Path revisited (2013) produced by the DRPU.
- 7.12 A report on salaries in South Africa (2013) produced by *Career Junction*.
- 7.13 Group discussions and interviews were held with key professional bodies and other stakeholders in February 2014 to test preliminary findings.

It is evident from the above, that a comprehensive and diverse range of information sources was employed and triangulated using a rigorous methodological approach, to establish the National Scarce Skills List (2014) consisting of the top 100 scarce skills in the country.

8. CONSULTATIONS

Representatives from a number of organisations were consulted in the process of verifying the list of scarce skills, including: the Department of Home Affairs, the Department of Trade and Industry, the Department of Economic Development, the Department of Labour, the Human Sciences Research Council, the Department of Public Service and Administration, Development Policy Research Unit (University of Cape Town), the SA Institute of Electrical Engineers, the SA Institute of Steel Construction, several Sector Education and Training Authorities, the Engineering Council of South Africa and the Engineering Industries Federation of South Africa.

9. KEY FINDINGS

- 9.1. **Joint Initiative on Priority Skills Acquisition (JIPSA):** JIPSA was established in 2006 as an initiative of the Accelerated and Shared Growth Initiative for South Africa to deal with the supply of priority skills to the economy.

It identified the following five priority skills areas for immediate attention:

- High-level, world-class engineering and planning skills for the “network industries”, namely transport, communications, water and energy;
- City, urban and regional planning and engineering skills;
- Artisanal and technical skills, with priority attention to infrastructure development, housing and energy, and in other areas identified as being in strong demand in the labour market;
- Management and planning skills in education and health; and
- Mathematics, science and language competence in public schooling.

In addition, JIPSA made proposals to prioritise skills initiatives in the fields of tourism, information and communication technology, business process outsourcing and bio-fuels.

The priority skills defined in the JIPSA process were driven by the political imperative for infrastructure development and job creation. Over a four-year period, between 2006 and 2009, the JIPSA process laid important foundations for the future of human resource development in South Africa.

- 9.2. **Industrial Policy Action Plan 2012/13 – 2014/15 (IPAP 2):** IPAP 2 of the Department of Trade and Industry represents a crucial component of the overall industrial strategy of the country. IPAP 2 has identified 3 sectors for leveraging market growth and associated upgrading of supply capacity and capability:

- Green industry: the manufacturing of componentry inputs into the renewable energy generation programme and solar power heating and other industrial opportunities arising from requirements of high energy efficiency in the economy;

- Agro-processing: including expediting regulatory and support mechanisms to establish a large-scale bio-fuels industry; identification and promotion of export market opportunities in net food-importing countries; and product development and standards support; and
- Fabrication, capital and transport equipment: leveraging large-scale procurement in rail and electricity, providing associated upgrading support; and taking advantage of mining capital equipment investment locally and on the rest of the continent.

IPAP 2 acknowledges that the availability of skilled people is vital to support growth in these sectors.

9.3 National Development Plan (NDP): The NDP (2010-2030) is an all-encompassing plan that offers a long-term perspective across all spheres of South African society. It identifies the role that different sectors should play in overcoming poverty and inequality and reducing unemployment, and the implications these have for skills development. It foregrounds the following in respect to skills needs:

- Public service delivery: the aim is to professionalise the public service to strengthen service delivery. It focuses on the need to improve the technical and managerial skills of public servants. The NDP highlights the fact that there are critical shortages of good-quality doctors, engineers, information technology professionals, forensic specialists, detectives, planners, accountants, prosecutors, curriculum advisors, among others, in the public service;
- Sustainable Livelihoods: provision of life skills programmes, entrepreneurship and community development programmes;
- Education and Training: increasing the pool of mathematics and science teachers at all levels in the system;
- Research and Development: increasing the skills pool of scientists, including the number of PhDs, for knowledge production and innovation;
- Public infrastructure: increase the number of engineers, technologists, technicians and artisans to support the roll-out of public programmes; and
- Health professionals: increasing the number of doctors and nurses.

9.4 New Growth Path (NGP): The New Growth Path is a bold, imaginative and effective strategy to create the millions of new jobs South Africa needs. The strategy sets out critical markers for employment creation and growth and identifies where viable changes in the structure and character of production can generate a more inclusive and greener economy over the medium to long run.

- Engineers: Target at least 30 000 additional engineers by 2014, changing subsidy formulae for universities as appropriate;

- Artisans: Target at least 50 000 additional artisans by 2015, with annual targets for state-owned enterprises;
- Workplace skills: Improve skills in every job and target 1, 2 million workers for certified on-the-job skills improvement programmes annually from 2013;
- Further education and training (FET) colleges: Colleges have a central role in providing important middle-level skills for young people; and
- Information and communications technology (ICT) skills: The departments of education should ensure that computer skills are taught in all secondary schools and form part of the standard adult basic education and training (ABET) curriculum by 2015. All public servants should also receive ICT training.

9.5 Strategic Integrated Projects (SIPs): The South African Government adopted a National Infrastructure Plan in 2012, which aims to transform the economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services. The plan also supports the integration of African economies.

Government will over 3 years from 2013/14 invest R827 billion in building new and upgrading existing infrastructures. These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.

This work has been organised into 18 Strategic Integrated Projects (SIPs) each of which has a dedicated SIP Coordinator to oversee the implementation and coordination of the numerous discrete projects that fall under each one.

The skills shortages identified in SIPs relate wholly to the engineering and built environment fields. There is a dire shortage of engineers, technologists, technicians and artisans across a range of disciplines.

9.6 Job Opportunities and Unemployment Report 2011-2012 (JOUR): The Department of Labour (DoL) provides an analysis of the number of vacancies recorded in the print media against the claims it receives by unemployed persons in relation to the Unemployment Insurance Fund (UIF). The outcome of this analysis signals skills mismatches that exist in the South African labour market.

Some occupations with a high number of vacancies include: various types of managers, senior officials in the public sector, engineers, technicians, artisans, mathematics and science teachers and Information technology (IT) professionals.

- 9.7 **HRDC report on the Production of Professionals (2013):** The HRDC established a Technical Task Team (TTT), to identify challenges related to the supply of professionals in South Africa, and for the development of interventions that could address certain shortfalls.

The Task Team's report focuses on a number of professions, taking into account national needs, as well as skills scarcities. The report compares the numbers of skilled professionals in South Africa in relation to population size, with the ratios obtaining in a number of other, comparator countries. While there are certain caveats concerning the data, it is clear that there is a large gap with respect to the numbers of professionals in SA, which needs to be addressed. In addition to a comparative study, the report also draws on previous research, interviews with professional bodies and reports from various forums.

The HRDC report highlights the need for the production of professionals in the following fields: engineering, mining, health care and the built environment.

- 9.8 **SETA Scarce Skills List (2013):** SETAs develop Sector Skills Plans (SSPs) which are essentially a human resource development plan for their respective sector. A key requirement of the SSP is to identify and list scarce skills in the designated sector. The SETA scarce skills lists represent the research findings of SETAs and are approved by employers, as well as labour. The list of occupations identified by each of the 21 SETAs as being scarce, were scored and weighted in line with the methodology described above.
- 9.9 **Pivotal Skills List (2013):** In 2013, in addition to their sectorally-based scarce skills lists, SETAs also generated a pivotal skills list which refers to the top ten ranked occupations on the SETA Scarce Skills List. Pivotal skills are earmarked for the pivotal grant funding mechanism of the DHET. The list of ten occupations identified by each of the 21 SETAs as being "pivotal," were scored and weighted in line with the methodology described above.
- 9.10 **Salary and Wage Analysis (2013/2014):** Salary and wage analysis was conducted to determine occupational trends. The CareerJunction (November 2013) website indicated high salary and wage growth for occupations in the top 100 list, well above inflation in many instances. Growth was strong for engineers, project managers, medical personnel, artisans and IT professionals. This data was used to corroborate the findings of occupations in this National Scarce Skills List (2014).

RANKING SCORECARD FOR NATIONAL SCARCE SKILLS LIST (2014)

The process of allocating scores and weights to establish the Top 100 occupations in high demand is set out as follows:

NO	POINTS ALLOCATION	MAXIMUM SCORE
1	SSP Scarce Skills List (2013): 1 point is allocated to an occupation if it is identified in a specific SETA Scarce Skills List (21 SETAs).	10
2	Pivotal Skills List (2013): 2 points are allocated to an occupation if it is identified in a specific SETA Scarce Skills List (21 SETAs). The breakdown is as follows:	
	Identified 5 times by SETAs	20
	Identified 4 times by SETAs	16
	Identified 3 times by SETAs	12
	Identified 2 times by SETAs	8
	Identified 1 time by a SETA	4
3	JIPSA: 10 points each are allocated to an occupation if it is identified in JIPSA.	10
4	NDP: 5 points are allocated to an occupation if it is identified in the NDP.	5
5	IPAP2: 5 points are allocated to an occupation if it is identified in IPAP2.	5
6	JOUR: Points are allocated to an occupation if it is identified in the index. The breakdown is as follows:	
	+1000 vacancies	10
	900-999 vacancies	9
	800-899 vacancies	8
	700-799 vacancies	7
	600-699 vacancies	6
	500-599 vacancies	5
	400-499 vacancies	4
	300-399 vacancies	3
	200-299 vacancies	2
	100-199 vacancies	1
7	Profession: 20 points are allocated to a profession if it is identified as scarce.	20
8	SIPs: 10 points are allocated to an occupation if it is identified as scarce in the SIPs List.	10
9	Study Duration: 10 points are allocated if an occupation requires a minimum of 3 years of formal study.	10
	TOTAL	100

10. NATIONAL SCARCE SKILLS LIST (2014)

NO	OCCUPATIONAL TITLE	OFO CODE
1	Electrical Engineer	215101
2	Civil Engineer	214201
3	Mechanical Engineer	214401
4	Quantity Surveyor	214904
5	Programme or Project Manager	121905
6	Finance Manager	121101
	Physical and Engineering Science Technicians*	311
8	Industrial and Production Engineers*	2141
	Electrician	671101
10	Chemical Engineer	214501
11	Construction Project Manager	132301
12	Mining Engineer	214601
	Accountant (General)	241101
14	Energy Engineer	215103
15	Materials Engineer	214907
16	Electronics Engineer	215201
17	Metallurgical Engineer	214603
18	Medical Superintendent / Public Health Manager	134201
	Telecommunications Engineers*	2153
20	Energy Engineering Technologist	215104
	Millwright	671202
22	Public Health Physician	221103
23	Nursing Professionals*	2221
24	Registered Nurse (child and family health)	332102
25	General Medical Practitioner	221101
	Veterinarian	225101
27	Industrial Pharmacist	226202
	ICT Systems Analyst	251101
29	Geologist	211401
	Hospital Pharmacist	226201
	Boiler Maker	651302
	Fitter and Turner	652302
33	Carpenter and Joiner	641501
	Welder	651202
35	Environmental Engineers*	2143
	Retail Pharmacist	226203

37	Manufacturing Managers*	1321
	SHEQ Practitioner	226302
	Vocational or Further Education Teachers*	2321
	Natural Science Teacher (Grade 10-12)	233102
	Plumber (General)	642601
	Automotive Motor Mechanic	653101
43	Agricultural Engineer	214905
	Foundational Phase School Teacher	234101
45	Mechanical Engineering Technologist	214402
	Software Developers*	2512
	Toolmaker	652201
48	Electrical Engineering Technologist	215102
	Land Surveyor	216502
	Diesel Mechanic	653102
	Electronic Instrument Trades Worker	672105
52	Sales and Marketing Manager	122101
	Mathematics Teacher (Primary)	233101
	Metal Fabricator	651401
	Industrial Machinery Mechanic	653301
56	Draughtsperson	311801
	Actuary	212101
	Agricultural Scientist	213202
	Retail Buyer	332301
	Air Conditioning and Mechanical Services Plumber	642701
	Automotive Electrician	672106
62	Supply and Distribution Manager	132401
	Civil Engineering Technologist	214202
	Materials Engineering Technologist	214908
	Electrical Installation Inspector	671102
66	ICT Project Manager	133102
	Mining Engineering Technologist	214602
	Metallurgical Engineering Technologist	214604
	Electronics Engineering Technologist	215202
	Computer Network and Systems Engineer	252301
	Mechatronics Technician	671203
72	Research and Development Manager	122301
	Chemical Engineering Technologist	214502
	Architect	216101
	Mathematics Teacher (Grades 10 to 12)	232123
	Pressure Welder	651201
	Retail Manager (General)	142103
78	Earthmoving and Related Plant Operators*	7342
79	Computer Network Technician	351301

80	Personnel / Human Resource Manager	121201
	Environmental Manager	134901
	Production/Operations Manager	134915
	Urban and Regional Planner	216401
	Network Analyst	252302
	Industrial Designer	216302
86	Local Authority Manager	111203
	Financial Investment Advisor	241301
	Health and Safety Manager	121206
	Water Quality Analyst	213306
90	Logistics	132402
	Chief Information Officer	133101
	Occupational Instructor / Trainer	242402
93	Corporate General Manager	121901
	External Auditor	241104
	Ship's Engineer	315101
	Rigger	651501
97	Forestry Technician	314301
	Retail Manager (General)	142103
99	Quality Systems Manager	121908
100	Medical Scientist	213110

*

**Refers to a cluster of occupations in this OFO category. Refer to Annexure A for specific occupations under these clusters.*

NOTE: Chartered accountants are an occupation in high demand. However, these professionals work in a range of occupations such as, but not limited to, CEOs, CFOs, financial managers, financial analysts, audits, project managers, general managers, and so. Thus the occupational title CA is not listed.

REFERENCES

Bhorat, H; Goga, S & Stanwix, B (2013). *Occupational shifts and shortages: skills challenges facing the South African economy*. Cape Town: DPRU.

Bhorat, H and Tian, N. 2013. *Growth, employment and skills: the New Growth Path revisited*. Cape Town: DPRU.

CareerJunction. 2013. *Salaries in South Africa*. www.cji.co.za

Department of Economic Development (2010). *The New Growth Path: agenda*. Pretoria: EDD.

Department of Higher Education and Training (2012). *White Paper for Post-School Education and Training*. Pretoria: DHET.

Department of Higher Education and Training (2013). *Organising Framework of Occupations*. Pretoria: DHET.

Department of Higher Education and Training (2013). *Learning pathways for SIPs scarce skills*. Pretoria: DHET.

Department of Labour. 2013. *Job Opportunities and Unemployment in the South African Labour Market 2011-2012*. Pretoria: DoL.

Department of Trade and Industry 2011/12 – 2013/14. (2012). *Industrial Policy Action Plan 2*. Pretoria: DTI.

Human Resource Development Council of SA. 2010. *Human Resource Development Strategy for South Africa (2010 – 2030)*. HRDCSA: Pretoria.

Human Resource Development Council of SA. 2012. *Key issues in improving the quantity and quality of professionals in South Africa*. HRDCSA: Pretoria.

National Planning Commission. 2012. *National Development Plan 2030*. Pretoria: NPC.

The Presidency. 2010. *Joint Initiative on Priority Skills Acquisition*, March. Pretoria: The Presidency.

ANNEXURE A: CLUSTER OF OCCUPATIONS**1321 Manufacturing Managers**

- 132101 Manufacturer
- 132102 Production / Operations Manager (Manufacturing)
- 132104 Engineering Manager
- 132105 Power Generation Production / Operations Manager

2141 Industrial and Production Engineers

- 214101 Industrial Engineer
- 214102 Industrial Engineering Technologist
- 214103 Production Engineer
- 214104 Production Engineering Technologist

2143 Environmental Engineers

- 214301 Environmental Engineer
- 214302 Environmental Impact and Restoration Analyst

2153 Telecommunications Engineers

- 215301 Telecommunications Engineer
- 215302 Telecommunications Engineering Technologist
- 215303 Telecommunications Network Engineer
- 215304 Telecommunications Field Engineer

2221 Nursing Professionals

- 222101 Clinical Nurse Practitioner
- 222102 Registered Nurse (Aged Care)
- 222103 Registered Nurse (Child and Family Health)
- 222104 Registered Nurse (Community Health)
- 222105 Registered Nurse (Critical Care and Emergency)
- 222106 Registered Nurse (Developmental Disability)
- 222107 Registered Nurse (Disability and Rehabilitation)
- 222108 Registered Nurse (Medical and Surgical)
- 222109 Registered Nurse (Medical Practice)
- 222110 Registered Nurse (Mental Health)
- 222111 Registered Nurse (Preoperative)
- 222112 Registered Nurse (Surgical)
- 222113 Paediatrics Nurse
- 222114 Nurse Educator
- 222115 Nurse Researcher
- 222116 Nurse Manager

2321 Vocational or Further Education Teachers

- 232101 Accounting Teacher (Grades 10 - 12)
- 232102 Agricultural Management Practices Teacher (Grades 10 - 12)
- 232103 Agricultural Sciences Teacher (Grades 10 - 12)
- 232104 Agricultural Technology Teacher (Grades 10-12)
- 232105 Business Studies Teacher (Grades 10-12)
- 232106 Civil Technology Teacher (Grades 10-12)
- 232107 Computer Applications Technology Teacher (Grades 10 - 12)
- 232113 Electrical Technology Teacher (Grades 10 - 12)
- 232114 Engineering Graphics and Design Teacher (Grades 10 - 12)
- 232117 Hospitality Studies Teacher (Grades 10 - 12)
- 232118 Information Technology Teacher (Grades 10-12)
- 232122 Mathematical Literacy Teacher (Grades 10 - 12)
- 232123 Mathematics Teacher (Grades 10 - 12)
- 232124 Mechanical Technology Teacher (Grades 10-12)
- 232126 Physical Science Teacher (Grades 10-12)
- 232128 Tourism Teacher (Grades 10 - 12)

2512 Software Developers

- 251201 Software Developer
- 251202 Programmer Analyst
- 251203 Developer Programmer

311 Physical and Engineering Science Technicians

- 3111 Chemical and Physical Science Technicians
 - 311101 Chemistry Technician
 - 311102 Physical Science Technician
- 3112 Civil Engineering Technicians
 - 311201 Civil Engineering Technician
 - 311202 Surveying or Cartographic Technician
 - 311203 Town Planning Technician
- 3113 Electrical Engineering Technicians
 - 311301 Electrical Engineering Technician
 - 311302 Electric Substation Operations Manager
 - 311303 Energy Efficiency Technician
- 3114 Electronics Engineering Technicians
 - 311401 Electronic Engineering Technician
- 3115 Mechanical Engineering Technicians
 - 311501 Mechanical Engineering Technician
 - 311502 Boilers and Pressure Vessels Inspector
 - 311503 Aeronautical Engineering Technician
- 3116 Chemical Engineering Technicians
 - 311601 Chemical Engineering Technician
- 3117 Mining and Metallurgical Technicians

311701 Mining Technician
311702 Metallurgical or Materials Technician
311704 Geophysical Technician
311705 Mine Ventilation Observer
311706 Rock Engineering Technician
311707 Strata Control Officer
3118 Draughtspersons
311801 Draughtsperson
3119 Physical and Engineering Science Technicians not Elsewhere Classified
311901 Forensic Technician (Biology, Toxicology)
311902 Fire Investigator
311903 Food and Beverage Technician
311904 Manufacturing Technician
311905 Industrial Engineering Technician
311906 Environmental Engineering Technician

7142 Plastic Products Machine Operators

714201 Plastic Cable making Machine Operator
714202 Plastic Compounding and Reclamation Machine Operator
714203 Plastics Fabricator or Welder
714204 Plastics Production Machine Operator (General)
714205 Reinforced Plastic and Composite Production Worker
714206 Rotational Moulding Operator (Plastics)
714208 Plastics Manufacturing Machine Minder
714209 Reinforced Plastics and Composite Trades Worker

7342 Earthmoving and Related Plant Operators

734201 Earthmoving Plant Operator (General)
734202 Backhoe Operator
734203 Bulldozer Operator
734204 Excavator Operator
734205 Grader Operator
734206 Loader Operator
734207 Mulcher Operator
734208 Tunnelling Machine Operator
734209 Mobile Explosives Manufacturing Unit (MEMU) Operator
734210 Scraper Operator
734211 Dragline Operator
734212 Railway Track Master
734213 Road Roller Operator
734214 Dump Truck Operator (Off-road)