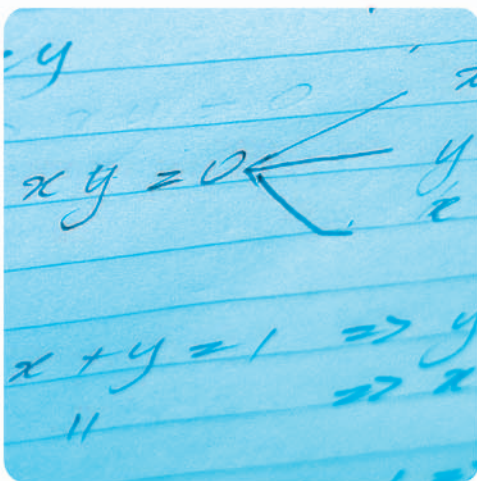


Faculty of Natural and Agricultural Sciences

Report 2008



Faculty of

**Natural and
Agricultural Sciences**

Report 2008

Issued by

Faculty of Natural and Agricultural Sciences
University of the Free State

Editorial compilation

Lacea Loader

Language revision

Nanette Lötter
Corrie Geldenhuys

Revision of bibliographical data

Mercia Coetzee

Layout and cover design

Chrysalis advertising and publishing

Photographers

Leonie Bolleurs
Stephen Collett
Reinier Brönn

Printing

Bloemfontein Repro Services

The Afrikaans version is also available on a compact disc from the dean's office or on the university's website at www.ufs.ac.za

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Preface

From the Dean's Office

In 2008 the Faculty of Natural and Agricultural Sciences once again lived up to its vision to be acknowledged as a faculty that is at the forefront of the practice of natural and agricultural science where the highest levels of quality and credibility are reflected.

During the year the faculty not only remained one of the leaders in training and career development in the natural and agricultural sciences, but it also made a concerted effort to enlarge its international footprint and to establish itself internationally. This is evident in the visits of staff from the faculty to universities such as the USA-based University of Minnesota and Virginia Polytechnic Institute and State University (Virginia Tech) and the extension of international agreements between the University of the Free State (UFS) and these institutions. The faculty also had the privilege of hosting a high-level delegation from the University of Minnesota on the Main Campus in Bloemfontein in August 2008.

The turmoil in the international markets firstly led to very high oil prices, which spilt over to the grain markets and high food prices. This, in turn, led to high inflation levels and therefore high interest rates. Eventually the exchange rate also deteriorated against the major currencies. In the latter part of the year the whole situation was turned upside down with the collapse of the financial markets. The faculty did not escape this and the price of equipment for which orders were placed sky rocketed. Innovative skills had to be applied to remain on track with our equipment strategy.

Although 2008 was an exceptionally difficult year for the UFS and the institution had to bear the brunt of the Reitz video and the reaction of the national and international community, the faculty still managed to perform and expand its core business.

The faculty offers multi-disciplinary and holistic courses to send skilled and capable students into the South African workplace and to empower the labour force. Our general and extended programmes are continuously assessed and improved in order to improve our throughput rates and quality of teaching.

The staff at the faculty worked tirelessly this year to broaden our product offering and to provide our students with the best quality teaching in the country. I applaud their efforts of expanding capacity, developing programmes and strengthening re-



Prof. Herman van Schalkwyk.

lationships both within and outside the faculty and the university.

I also want to applaud the staff and students of the faculty with their achievements this year – whether it is on a personal level, in their capacity as staff member of their respective department/centre or for the faculty. To mention a few:

- Ms Estelle Heideman HIV/Aids coordinator of the Lengau Agricultural Development Centre, received a bursary to participate in a leadership programme in the United States of America (USA), which trains female leaders in South Africa who contribute to the prevention of HIV at a local, regional and national level;
- In the Department of Agricultural Economics, Prof. Johan Willemse, known for his contribution towards agriculture, was appointed on the non-executive board of Absa;

Staff in the dean's office



The staff working in the dean's office are, from the left, front: Ms Stefanie Naborn, Manager: Marketing and Liaison, Ms René Bloem, Secretary, Prof. Neil Heideman, Vice-Dean: Faculty of Natural and Agricultural Sciences; back: Mr Clasia Claassen, Assistant Administrative Officer, Mr Johan Kruger, Faculty Manager, Ms Lorinda Rust, Secretary, and Ms Mitzie Cloete, Typist/Clerical Assistant.

- Prof. James du Preez, Departmental Chair of the Department Microbial, Biochemical and Food Biotechnology, received the silver medal for exceptional published research awarded at the biennial conference of the South African Society for Microbiology hosted in Graham's Town. It was only the seventh time since 1986 that the medal was awarded;
- A study of the UFS about how the change in the packaging of DNA with cellular development is influenced by the expression of genes, in which Prof. Hugh Patterson played a leading role, was published in a leading peer-reviewed scientific journal *Proceeding of the National Academy of Sciences* of the USA (PNAS). The PNAS journal has an impact factor of 10, which means that studies published in this journal are referred to by ten other scientific studies within the scope of two years;
- Prof. Riaan Luyt, professor in Chemistry and head of the Natural Sciences Programme at the Qwaqwa Campus, received an honorary medal from the Polymer Institute of the Slovak Academy of Sciences during a conference hosted in the High Tatras mountains of Slovakia;
- Prof. Maryke Labuschagne from the Department of Plant Sciences was the recipient of the National Science and Technology Forum's (NSTF) research capacity-development award. A team consisting of Prof. Jan van der Westhuizen and Dr Susan Bonnet from the Department of Chemistry, Prof. Kenneth Swart and Prof. Thinus van der Merwe from FARMOVS-PAREXEL also

received the innovation award for an outstanding contribution to science, engineering and technology by either an individual or a team over the last ten years from the NSTF;

- Prof. Maryke Labuschagne received a second prestigious national award for her research when the 2008 Cereal Science and Technology - SA's (CST-SA) Award for research and development was awarded to her; and
- Prof. Ivan Horak, extraordinary professor at the university's Department of Zoology and Entomology, became the third person in the history of the UFS to receive the D.Sc. degree.

In closing I would like to thank the faculty's lecturing staff for their support and enthusiasm during the past year. However, none of these achievements would have been possible without the interest and hard work of the administrative staff.

During 2008 we have all worked together to live up to the faculty's motto: "There is no substitute for excellence!" This report covers the activities of the faculty in 2008. It is a reflection of a year's commitment from a team of highly skilled academic and support staff.

Prof. Herman van Schalkwyk
Dean: Faculty of Natural and Agricultural Sciences
University of the Free State

Faculty news

Successful visit from delegation of the University of Minnesota

A senior delegation from the University of Minnesota in the United States of America (USA) paid a very successful visit to the University of the Free State (UFS) in May 2008 to explore ways of strengthening already existing ties between the two institutions.

Teacher training, capacity building in health sciences and student preparedness were among the areas of cooperation that were investigated, within the context of the Strategic Academic Cluster initiative of the UFS. Poverty reduction strategies were also a strong focus area.

The Faculty of Natural and Agricultural Sciences has had a cooperation agreement with the University of Minnesota's Department of Applied Economics since 2002 and the exchange of staff



During the visit are, from the left: Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS, Prof. Robert Jones, Senior Vice-President: System Academic Administration at the University of Minnesota, Dr Meredith Quiad, Associate Vice-President and Dean: International Programmes, University of Minnesota, Prof. Teuns Verschoor, Acting Rector of the UFS and Prof. Ezekiel Moraka, Vice-Rector: Student Affairs at the UFS.

has been taking place on a regular basis. This agreement will be expanded and both institutions are now exploring the possibility of

applying it across faculties. Both institutions have committed seed funding to formalise the cooperation agreement.

50 years of Agriculture celebrated



The faculty celebrated 50 years of the teaching of agriculture at the UFS in November 2008. Part of the celebrations was a seminar with the theme "Challenges in a changing agricultural environment". Some of the guest speakers are, from the left: Mr Corwyn Botha, Chairman: Agri Business Chamber and Managing Director of the Cape Agri Group, Mr Motsepe Matlala, President of NAFU, Mr Hans van der Merwe, Executive Head: Agri SA, Prof. Herman van Schalkwyk: Dean: Faculty of Natural and Agricultural Sciences at the UFS, and Mr Sugar Ramakarane, Head: Department of Agriculture, Free State Province.

Winners of NSTF awards assist with recruitment of students



Here are, from the left: Dr Martin Ntwaeaborwa, senior lecturer at the Department of Physics and finalist in the category for black researchers, Prof. Kenneth Swart, FARMOVS-PAREXEL, Prof. Maryke Labuschagne, head of Plant Breeding at the UFS's Department of Plant Sciences and female recipient of the award for the development of research capacity over the past five to ten years, and Prof. Jan van der Westhuizen, Department of Chemistry at the UFS; front: Ms Kedibone Aphane, MRC. Prof. Swart and Prof. Van der Westhuizen were the leaders of the team who received the award for the development of innovation by a corporate organisation or institution.

Representatives of the South African Medical Research Council (MRC) visited the UFS to recruit students who want to study in the fields of sci-

ence, engineering and technology. To assist with the recruitment, the winners of awards made by the National Science and Technology Forum (NSTF) earlier this year,

made presentations to create an interest amongst students. The UFS had four finalists of whom two were the winners in their respective categories.

Young scientists learn what faculty can offer



Young science lovers gathered in Sasolburg for the annual Sasol TechnoX in August 2008. The faculty's exhibition captured the learners' attention through an interactive representation of the application fields of science. Delegates from the Departments of Mathematics and Applied Mathematics, Chemistry, Zoology and Entomology, as well as UFS Marketing stood ready to answer the questions of the 20 832 learners who attended the event. Pictured here is Theo Viljoen, M.Sc. student in Forensic Entomology, sharing interesting facts regarding insects with learners.

Two UFS academics appointed on the Land Bank Board



Prof. Herman van Schalkwyk (left), Dean: Faculty of Natural and Agricultural Sciences, and Mr Theo Potgieter from the UFS School of Management were appointed on the Land Bank Board in March 2008. Prof. van Schalkwyk was appointed as Director and Deputy Chairperson and Mr Potgieter as Director of the Board. The appointments were made by the Minister of Agriculture and Land Affairs, Ms Lulu Xingwana, and are effective for a period of four years.

UFS extends exchange agreement with USA university



Here are, from the left, front: Dr SK de Datta, Vice-Rector: International Affairs, VT, Prof. Herman van Schalkwyk, Dean of the Faculty of Natural and Agricultural Sciences, UFS, Dr Martin Ntwaeaborwa, senior lecturer at the Department of Physics, UFS; back: Prof. Jim McKenna, Department of Crop, Soil and Environmental Affairs, VT, Prof. Izak Groenewald, Director of the Centre for Sustainable Agriculture and Rural Development at the UFS and responsible for the faculty's international liaison, Dr Michael Bertelsen, VT's international office, Dr Aldo Stroebel, Head: Internationalisation at the UFS and Dr Liesel Herselman, senior lecturer at the Department of Plant Sciences, UFS.

A delegation from the faculty visited the Virginia Tech University (VT) in the USA in June 2008 to confirm and extend the existing student exchange agreements between the two institutions.

During the visit the agreement, which started in 1997, was extended for the next five years. More than 150 students from both institutions have already taken part in this exchange agreement and it is the most successful student exchange agreement that VT is involved in. Although agricultural students from the UFS initially took part in the agreement, it was extended to other departments in the faculty and also to the rest of the UFS.

Itjoriseng Project launched



The faculty launched the Itjoriseng Project on the Main Campus in Bloemfontein in March 2008. The aim of the project is to improve the skills of teachers in the subjects Mathematics and Physical Science for Grades 10–12. "Itjoriseng" is the Sotho word for "sharpen yourself". At the launch were, from the left: Mr Mzamo Jacobs, Director: Curriculum Development for Further Education and Training, Free State Department of Education, Mr Johan Kruger, Faculty Manager, Ms Elna Marais, Chief Education Specialist: Curriculum Development, Free State Department of Education, and Prof. Herman van Schalkwyk, Dean: Faculty of Natural and Agricultural Sciences at the UFS.

2007 Faculty report launched



The faculty once again produced another report in which the various departments and centres highlighted their activities for 2007. The report was so well received that a second edition had to be printed. Here are some of the departmental chairpersons during the launch of the report in June 2008.

Department of

Quantity Surveying and Construction Management

"We have received international accreditation by two prestigious professional bodies, and national accreditation by three statutory bodies" - Prof. Basie Verster.



Prof. Basie Verster.

Ms Desmé Human, an honours student, received the Kenneth K. Humphreys award from the International Cost Engineering Council (ICEC). This award is seen as the most prestigious international award of its kind, and was awarded to Ms Human for the most outstanding Quantity Surveying paper submitted by a student or a young adult for the period 2006–2008.

With regard to research, the department is one of 14 international research associates that took part, together with the Wirtshfts University of Vienna, Austria, in a joint research project on Maturity in Project Oriented Communities from 2005-2007. Four invited papers on the South African results have already been presented in Vienna. The final international research report was published in 2007 by the Viennese partners.

The department took part in research projects together with the Council for Scientific and Industrial Research (CSIR), Trac and the Construction Industry Development Board (CIDB), and comprehensive results were made known in 2008. During the same year, an additional research project on Indicators for the Construction Industry was successfully completed for the CIDB. Departmental lecturers and students also presented ten successful papers at international congresses in Toronto and Edmonton, Canada.

In the field of education, students are offered lectures through the medium of residential or open learn-

Overview

During 2008, the Department of Quantity Surveying and Construction Management was involved in various activities, events and developments and experienced a number of highlights.

The University of the Free State (UFS) is currently the only university outside the United Kingdom (UK) which offers an internationally accredited open learning programme in Quantity Surveying, as accredited by the Royal Institution of Chartered Surveyors (RICS).

Furthermore, unconditional international accreditation was also awarded to the department, with Accredited Centre Status, by the

Chartered Institute of Building (CIOB).

Students performed well on national as well as international level. In 2008, Mr HJ Grobbelaar, an honours student, received the prestigious RICS prize, and Ms MSF Pietersen, a third-year student, the Bell-John prize for the most versatile student in any study year. Ms PD Makhado received the South African student prize from the CIOB for the highest average overall average in B.Sc. Honours (Construction Management). She also received the LTA Building prize and the PPS prize for the best final year student in B.Sc. (Construction Management).



Lecturers and students delivered papers during the conference of the Pacific Association of Quantity Surveyors (PAQS) held in Edmonton, Alberta, Canada. Here are, from the left: Profs Basie Verster, Andries Hauptfleisch, Mss AHJ du Toit, Benita Kotzé, Messrs Nic Lesar, Carl van Zyl, Mark Ward and Pierre Oosthuizen.

ing programmes. In 2008, the department served a total of 320 undergraduate students, 116 honours students, 41 students on master's level, and six Ph.D. students.

The department also presents various registered short programmes and courses as an additional training action. In 2008, 42 students were registered for the QCP open learning programme; 92 students completed the Facilities Management Programme (FMP) supported by the South African Property Owners Association (SAPOA); and 42 Project Management students completed the Intensive Project Management programme (IPMP), also supported by SAPOA.

The department's involvement with the community is recognised by the continued mentorship programme offered to emerging entrepreneurs. The Centre for Construction Entrepreneurs has for the past 20 years offered training to many small, emerging building contractors. The successful Facilities Management programme, offered over a period of three years, was initiated in 2008 with 20 students registered during the first year.

Through the medium of the accredited Construction Mentorship Programme, the department

offers an on-going development service to emerging building contractors and other interest groups. The principle of the mentor-based development programme is currently the standard component for development in the construction industry. The highly reputed Expanded Public Works Programme (EPWP) accepted the principle of mentors for emerging building contractors in their programme. Personnel of the UFS, together with the CSIR and other consultants, are leading the development and implementation of mentorships. Mentors who present mentorship services are accredited by the UFS.

Over the past few years, the department has delivered significant contributions to the various professions in the construction industry and has maintained statutory accreditation by the South African Council for the Quantity Surveying Profession (SACQSP), the South African Council for the Project and Construction Management Profes-

sions (SACPCMP), and the South African Council for the Property Valuers Profession (SACPVP). Internationally, the department is accredited by the RICS in the UK and the CIOB, also in the UK. This accreditation was reconfirmed in 2008.

Alumni of the university practise mainly in South Africa, but many are employed in countries such as England, Ireland, Dubai and some African countries. To serve the many facets of the industry, per-

Ms Desmé Human received the Kenneth K. Humphreys Award from the International Cost Engineering Council (ICEC) in Toronto, Canada. Here she is with Prof. Basie Verster, Head of the Department.



sonnel are appointed from diverse backgrounds such as quantity surveying, construction management, project management, engineering and property economy.

Prof. Basie Verster, Head of the Department, serves on the South African Council for the Quantity Surveying Profession, is Chairman of the Education Standards and Research Committee of the Council and serves on the Management Board of the Association of South African Quantity Surveyors (ASAQS). Prof. Verster also serves on the UFS Council.

Dr Hendrik Marx was elected as Honourary Secretary and Board Member of the Association of Schools of Construction of Southern Africa (ASOCSA).

On international level, members of the department are actively involved in committees of the Chartered Institute of Building – South Africa (CIOB-SA), the ICEC, and the RICS in the UK, and Prof. Verster was appointed Vice-Chairman (Education) of the CIOB (Africa).

The *Acta Structilia* is a fully accredited scientific journal, endorsed by the South African Council for the

SACQSP and the RICS. In 2008, the journal celebrated its 15th year. This journal offers publication opportunities for independent, peer-reviewed articles by local and overseas researchers on the fields of physical and development sciences. Since 1993, 64 research articles, eight review articles, 12 international articles, 12 commentaries, eight book reviews and eight introductions have been published in the journal.

In 2008 the 24th publication of the student journal, *Bouvaria*, was published. ■

Staff

Professor: Prof. Basie Verster

Contract Professor: Prof. Andries Hauptfleisch (in Midrand)

Senior Lecturer: Dr Hendrik Marx

Lecturers: Messrs Frank Berry, Ben Swart, Hendrik van Vuuren, Ms Benita Kotzé

Contract Lecturers: Messrs Carl van Zyl, Pierre Oosthuizen

Academic Assistants: Mss Alna Beukes, Alet Esterhuyse, Marie-Louise Roux

Secretary: Ms Elza van der Walt

Administrator, Distance Learning: Ms Elize Scholtz

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Typist/Clerk: Ms Sandra Olivier

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Research outputs

Research articles

Hauptfleisch, A.C. 2008. Facilities management: An analysis of evolving educational needs in a developing profession. *ACTA Structilia* 15(1): 133-141.

Verster, J.J.P., Hauptfleisch, A.C. & Kotzé, B.G. 2008. Dimensions of a mature quantity surveying profession. *ACTA Structilia* 15(1): 22-38.

Chapters in books

Hauptfleisch, A.C. 2008. Facilities management: A primary body of knowledge for tertiary and continuing education in facilities management in South Africa. In *SAPOA/IPD Real Estate Research Yearbook 2008*, edited by P. Leitich and U. Leitich. Johannesburg, University of the Witwatersrand. pp. 246-251.

Conference contributions

Berry, F.H. & Du Toit, A.H.J. 2008. *Communication instruments used by the engineering and quantity surveying professions and their communication capabilities in the construction industry.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.

Berry, F.H., Kotzé, B.G. & Du Toit, A.H.J. 2008. *The performance of professional quantity surveyors compared with engineers, architects and project managers in terms of communication capabilities and communication instruments: A future perspective.* Paper presented at the South African Council

for the Quantity Surveying Profession Conference (SACQSP 2008), Midrand, Johannesburg, South Africa. 10 October.

Hauptfleisch, A.C. 2008. *Facilities management: Validation of a primary body of knowledge for tertiary and continuing education in South Africa.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.

Hauptfleisch, A.C. 2008. *The role of total quality management as a key intervention in small construction capacity building in South Africa.* Paper presented at the 5th Post Graduate Conference on Construction Industry Development (CIDB), University of the Free State, Bloemfontein, South Africa. 16-18 March.

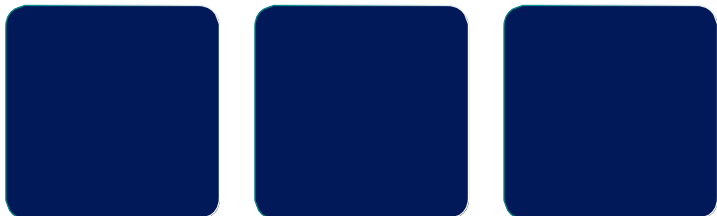
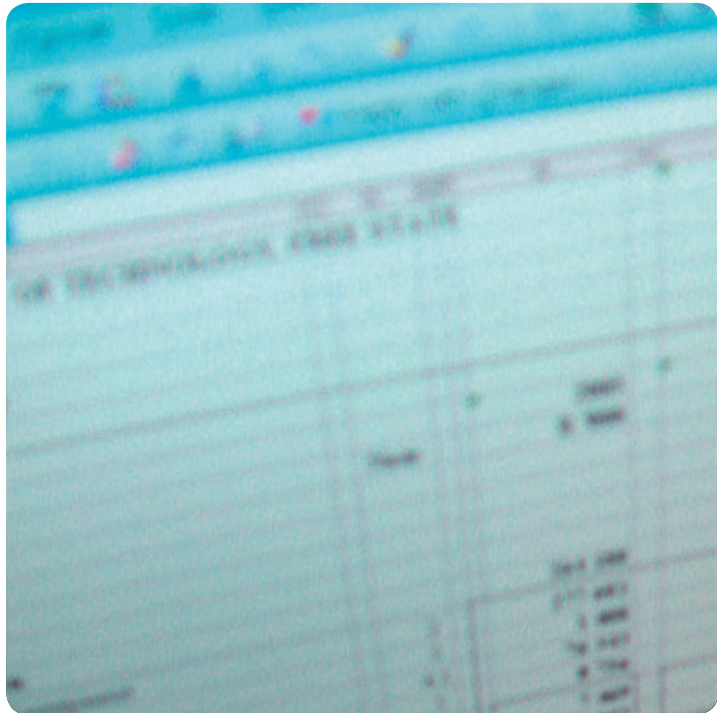
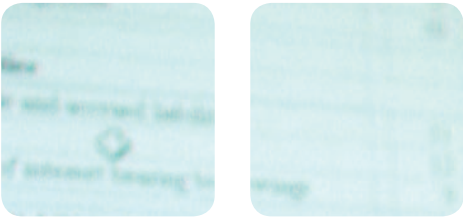
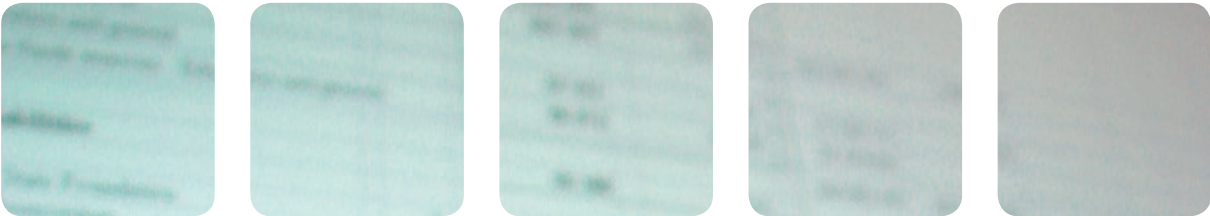
Hauptfleisch, A.C., Verster, J.J.P. & Lazarus, S. 2008. *The quantification of outcomes in emerging construction contractor development.* Paper presented at the Association of Schools of Construction of Southern Africa (ASOCSA) and the Council for the Built Environment (CBE): The 3rd Built Environment Conference, Cape Town, South Africa. 6-8 July.

Human, D. 2008. *Implementation of affirmative action and Black Economic Empowerment (BEE) in the construction industry.* Paper presented at the 52nd Annual Meeting of the Association for the Advancement of Cost Engineering (AACE) International and the 6th World Congress of the International Cost Engineering Council (ICEC) on Cost

- Engineering, Project Management and Quantity Surveying, Toronto, Canada. 29 June-2 July.
- Kotzé, B.G. & Verster, J.J.P.** 2008. *The built environment in Southern Africa: The influence of diversity, culture and tourism on conservation.* Paper presented at the International Council on Building (CIB W89) International Conference in Building Education and Research (BEAR 2008), Heritage Kandamala, Sri Lanka. 10-15 February.
- Kotzé, B.G., Berry, F.H. & Verster, J.J.P.** 2008. *Communication as a crucial element in project management.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Kotzé, B.G., Berry, F.H. & Verster, J.J.P.** 2008. *Communication and communication instruments as project development interventions.* Paper presented at the Association of Schools of Construction of Southern Africa (ASOCSA) and the Council for the Built Environment (CBE): The 3rd Built Environment Conference, Cape Town, South Africa. 6-8 July.
- Kotzé, B.G., Verster, J.J.P. & Berry, F.H.** 2008. *Construction industry standardisation and effective communication.* Paper presented at the 5th Post Graduate Conference on Construction Industry Development (CIDB), University of the Free State, Bloemfontein, South Africa. 16-18 March.
- Lezar, N. & Verster, J.J.P.** 2008. *Implementation of training for first-line supervisors and the development of mentorship programmes for supervisors in the construction industry.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Marx, H.J.** 2008. *Contractors' perspective of the condition of the construction industry as captured by the CIDB survey of construction industry indicators 2007.* Paper presented at the South African Council for the Quantity Surveying Profession Conference (SACQSP 2008), Midrand, Johannesburg, South Africa. 10 October.
- Okumbe, J.O.** 2008. *Development of mechanisms implemented to limit financial risks in the South African construction industry.* Paper presented at the 11th Annual Research Seminar, Central University of Technology, Bloemfontein, South Africa. 17 October.
- Okumbe, J.O.** 2008. *Evaluation of an awareness and practices in the built environment.* Paper presented at the Council for the Built Environment (CBE) 2008 Inaugural Annual Symposium of the Built Environment: Asserting Relevance in a Booming Built Environment, Gallagher Estates, Midrand, Johannesburg, South Africa. 14-15 May.
- Okumbe, J.O. & Verster, J.J.P.** 2008. *Construction industry perspective on causes and effects of delays in South Africa.* Paper presented at the Royal Institution of Chartered Surveyors (RICS) Construction and Building Research Conference (COBRA 2008), Dublin, Ireland. 4-5 September.
- Okumbe, J.O. & Verster, J.J.P.** 2008. *Selection and administration of construction contracts in Botswana.* Paper presented at the Association of Schools of Construction of Southern Africa (ASOCSA) and the Council for the Built Environment (CBE): The 3rd Built Environment Conference, Cape Town, South Africa. 6-8 July.
- Oosthuizen, P.M. & Grobbelaar, H.** 2008. *The valuation of building replacement cost in South Africa.* Paper presented at the Association of Schools of Construction of Southern Africa (ASOCSA) and the Council for the Built Environment (CBE): The 3rd Built Environment Conference, Cape Town, South Africa. 6-8 July.
- Oosthuizen, P.M. & Verster, J.J.P.** 2008. *A quantity surveying maturity model as a benchmark tool for future development beyond 2010.* Paper presented at the South African Council for the Quantity Surveying Profession Conference (SACQSP 2008), Midrand, Johannesburg, South Africa. 10 October.
- Oosthuizen, P.M. & Verster, J.J.P.** 2008. *Measurement methodology for quantity surveying maturity.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Samuel, R.** 2008. *Effective and efficient project management on government projects.* Paper presented at the 5th Post Graduate Conference on Construction Industry Development (CIDB), University of the Free State, Bloemfontein, South Africa. 16-18 March.
- Verster, J.J.P., Hauptfleisch, A.C. & Kotzé, B.G.** 2008. *Lessons learned in avoiding differences and disputes: A quantity surveying perspective based on a case study in project communication.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Verster, J.J.P., Hauptfleisch, A.C. & Kotzé, B.G.** 2008. *Dimensions of quantity surveying maturity and the development of the profession towards a learned society.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Verster, J.J.P., Hauptfleisch, A.C. & Kotzé, B.G.** 2008. *The pillars of quantity surveying for a learned society.* Paper presented at the 52nd Annual Meeting of the Association for the Advancement of Cost Engineering (AACE) International and the 6th World Congress of the International Cost Engineering Council (ICEC) on Cost Engineering, Project Management and Quantity Surveying, Toronto, Canada. 29 June-2 July.
- Ward, M.C. & Verster, J.J.P.** 2008. *Sustainable urban development: Lessons for emerging markets.* Paper presented at the 12th Annual Pacific Association of Quantity Surveyors (PAQS) 2008 Congress: Construction in Challenging Environments. Edmonton, Alberta, Canada. 16-18 June.
- Zietsman, R.** 2008. *Defects in the construction industry – Then and now.* Paper presented at the 5th Post Graduate Conference on Construction Industry Development (CIDB), University of the Free State, Bloemfontein, South Africa. 16-18 March.



Statistical data

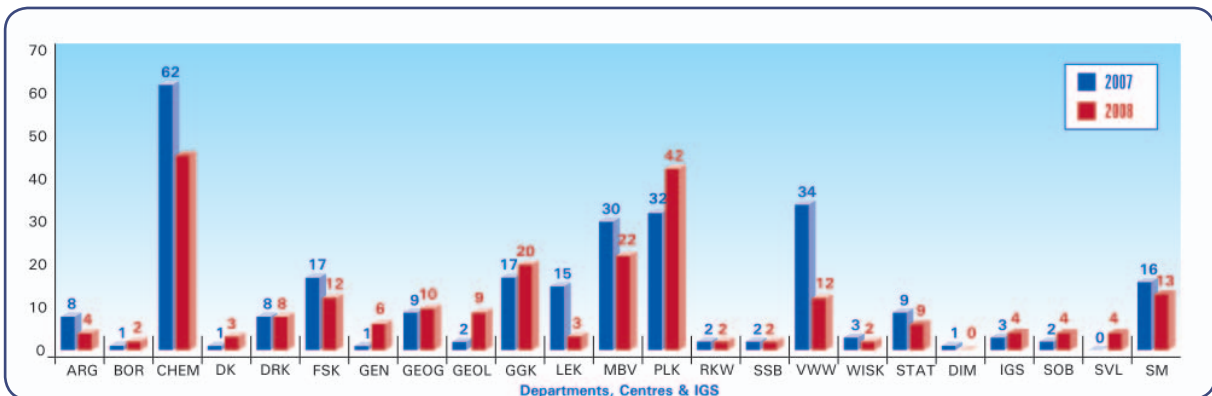


Research outputs: 2007-2008

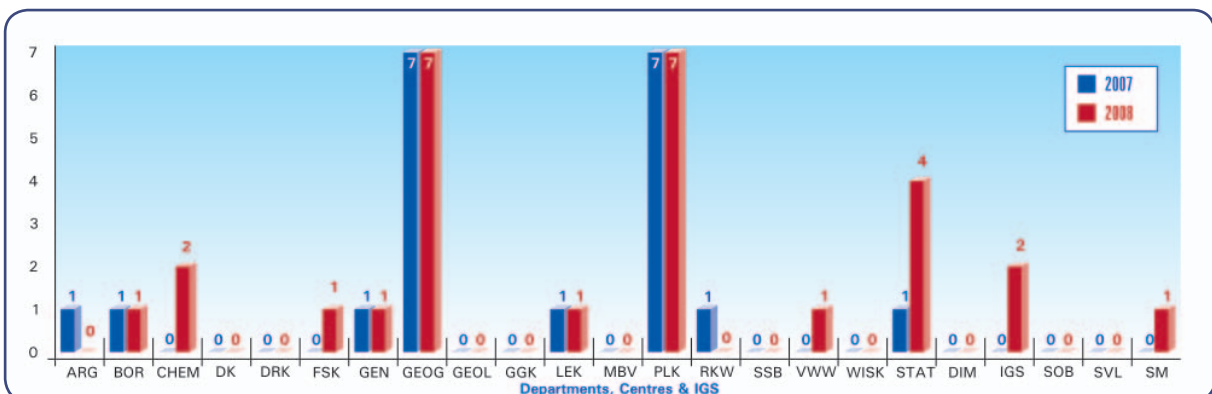
List of abbreviations

Abbreviation	Name	Abbreviation	Name
ARG	Department of Architecture	GGK	Department of Soil, Crop and Climate Sciences
BOR	Department of Quantity Surveying and Construction Management	IGS	Institute for Groundwater Studies
SOB	Centre for Environmental Management	LEK	Department of Agricultural Economics
CEM	Department of Chemistry	MBV	Department of Microbial, Biochemical and Food Biotechnology
SM	Centre for Microscopy	PLK	Department of Plant Sciences
SVL	Centre for Sustainable Agriculture and Rural Development	RKW	Department of Computer Science and Informatics
DK	Dean's Office	SSB	Department of Urban and Regional Planning
DRK	Department of Zoology and Entomology	SRB	Disaster Management Training and Education Centre for Africa (DIMTEC)
FSK	Department of Physics	VWW	Department of Animal, Wildlife and Grassland Sciences
GEN	Department of Genetics	STAT	Department of Mathematical Statistics and Actuarial Science
GEOG	Department of Geography	WISK	Department of Mathematics and Applied Mathematics
GEOL	Department of Geology		

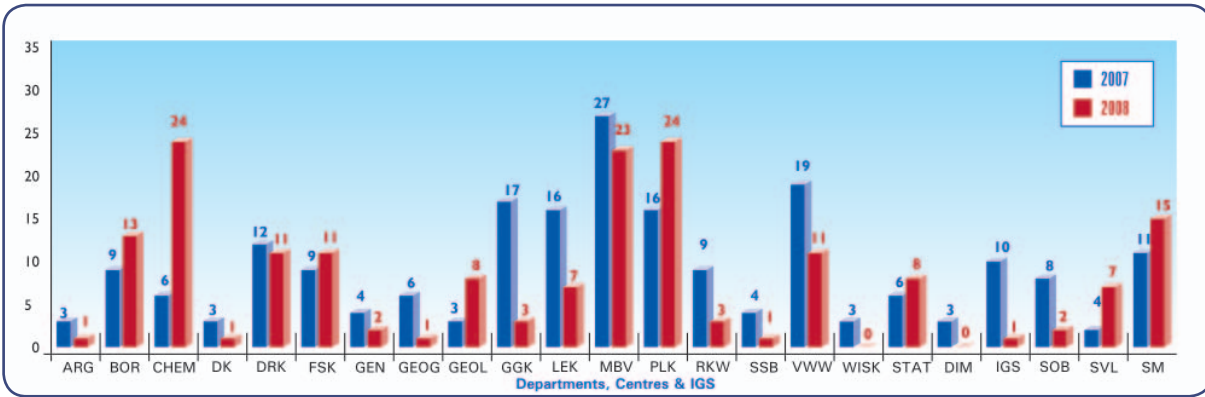
Accredited articles



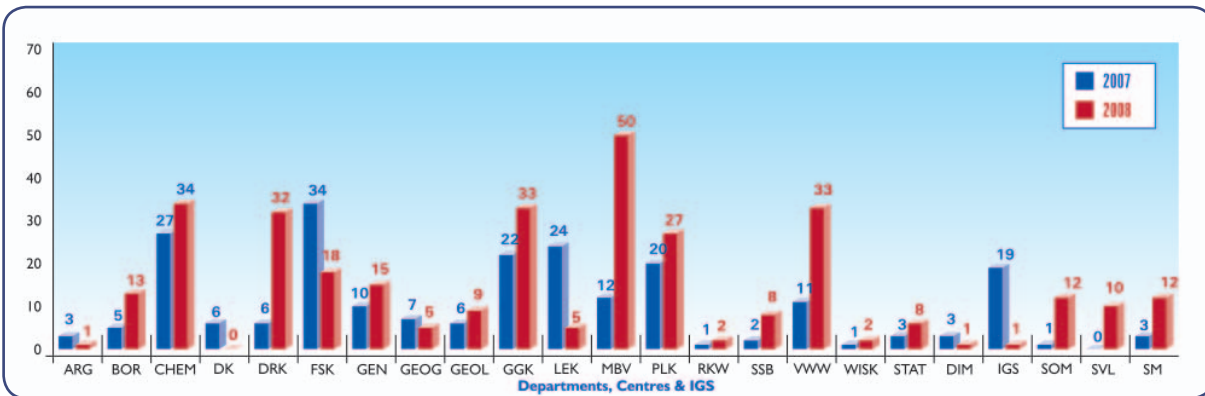
Books



International conferences



Local conferences



Student figures: 2007-2008

Student figures

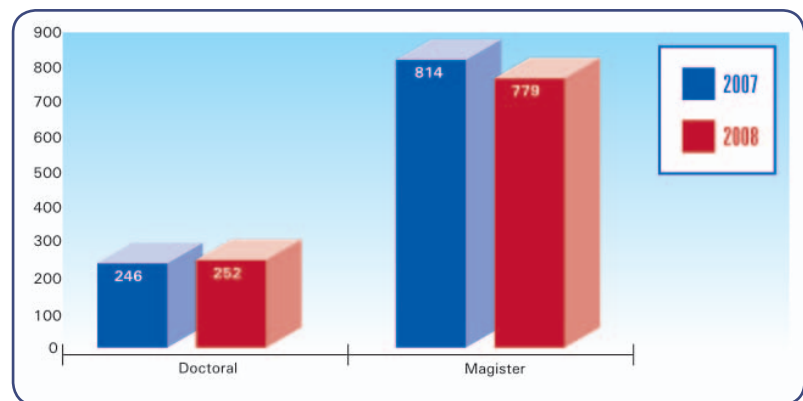
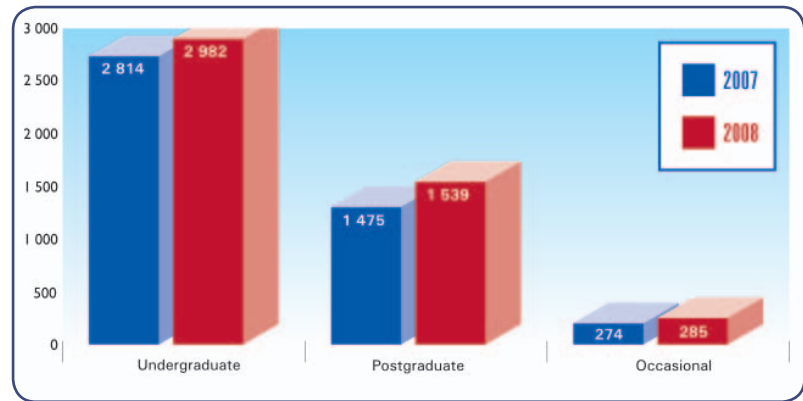
Year	Description	Black	Coloured	Asian	White	Total
2007	Undergraduate	1492	66	38	1218	2814
	Postgraduate	710	41	40	684	1475
	Occasional	230	6	2	36	274
*TOTAL		2432	113	80	1938	4563
2008	Undergraduate	1667	51	37	1227	2982
	Postgraduate	755	40	43	701	1539
	Occasional	260	5	1	19	285
* TOTAL		2682	96	81	1947	4806

International students

Nationality	Year	Year
	2007	*2008
Angola	2	0
Asian countries	20	24
Botswana	17	23
Democratic Republic of the Congo	0	1
European countries	9	10
Lesotho	118	144
Malawi	3	5
Mauritius	2	3
Mozambique	4	7
Namibia	54	65
North America	15	5
Other African countries	47	69
South America	1	0
Swaziland	5	6
Zambia	7	7
Zimbabwe	48	60
Total	352	429

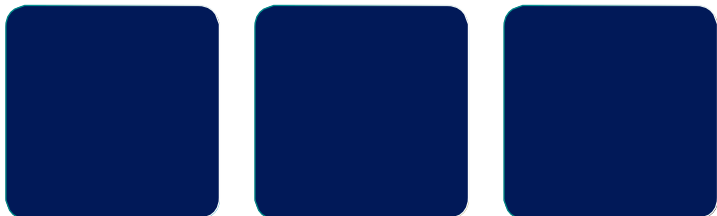
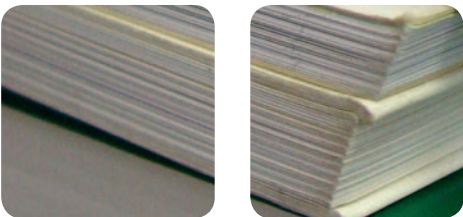
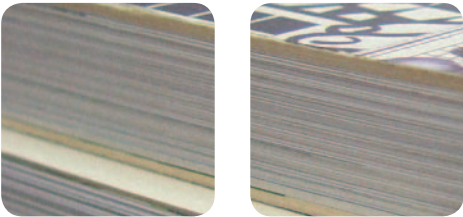
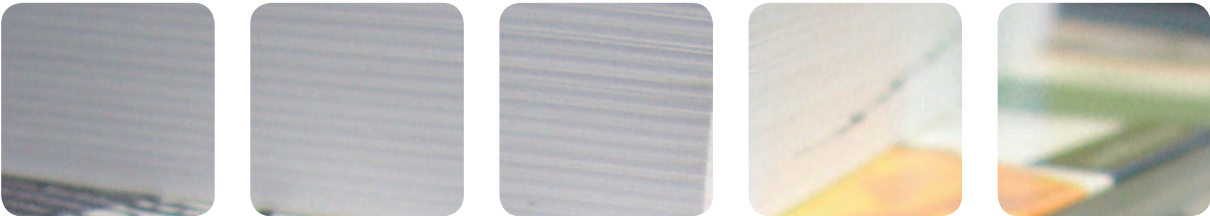
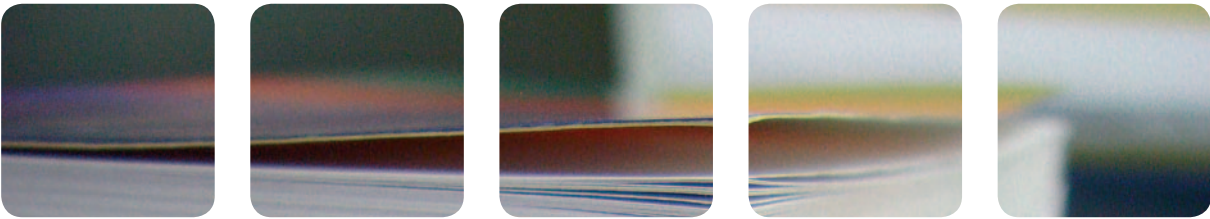
*2008 Final HEMIS figures not available

Comparison for the Faculty of Natural and Agricultural Sciences





Glossary



Glossary

A

AACC -	American Association for Cereal Chemists
AACE -	Association for the Advancement of Cost Engineering
ADF -	Amsterdam Density Functional Programme
ADG -	Average Daily Grain
AEASA -	Agricultural Economics Association of South Africa
AEON -	the African Earth Observation Network
AGU -	American Geophysical Union
AI -	Artificial Insemination
ARC -	Agricultural Research Council
ARV -	Antiretroviral
ASC -	Architecture Student Conference
ASAQS -	Association of South African Quantity Surveyors
ASOCSA -	Association of Schools of Construction of Southern Africa

B

BBSRC -	Biotechnology and Biological Sciences Research Council
BMBF -	Federal Ministry of Education and Research, Germany

C

CAA -	Commonwealth Association of Architects
CANSA -	Cancer Association of South Africa
CAB -	Centro de Astrobiología
CED -	Centre for Education Development
CePHMa -	Centre for Plant Health Management
CHESD -	Centre for Higher Education Studies and Development
CHPC -	Centre for High Performance Computing
CIDB -	Construction Industry Development Board
CIOB-SA -	Chartered Institute of Building, South Africa
CSIR -	Council for Scientific and Industrial Research Organisation
CSTA -	Cereal Science and Technology Association
CUT -	Central University of Technology

D

DiMTEC -	Disaster Management Training and Education Centre for Africa
DMISA -	Disaster Management Institute of Southern Africa
DRRW -	Durable Rust Resistance in Wheat
DST -	Department of Science and Technology
DWAF -	Department of Water Affairs and Forestry

E

ECA -	European Crystallographic Association
EGIC -	Economic Growth and International Competitiveness
EMSA -	Environmental Management Systems Association
EMS -	Environmental Management Systems
EPWP -	Expanded Public Works Programme

F

FAO -	Food and Agricultural Organisation
FETWater -	Framework Programme for Research Education and Training in Water
FMP -	Facilities Management Programme
FSRDPP -	Free State Rural Development Partnership Project
FTIR -	Fourier Transform Infra Red Spectrometer

G

FGAP -	Facility for Genomics and Proteomics
GIS -	Geographical Information Systems
GMO -	Genetically Modified Organisms
GRDM -	Groundwater Resource Directed Measures
GSSA -	Grassland Science Society of South Africa
GSSA -	Geological Society of South Africa

H

HCI -	Human-computer Interaction
HRTEM -	High Resolution Transmission Electron Microscopy

I

IAMA -	International Food and Agribusiness Management Association
IAU -	International Astronomical Union
ICACS -	International Conference on Atomic Collisions in Solids
ICCC -	International Conference on Coordination Chemistry
ICEC -	International Cost Engineering Council
ICRISAT -	International Crops Research Institute for the Semi-Arid Tropics
ICSU -	International Council for Science
IDC -	Industrial Development Corporation
IGC -	International Geological Congress
IGS -	Institute for Groundwater Studies
IMWA -	International Mine Water Association
INCRoP -	Insects on New Crops Programme
IPMP -	Intensive Project Management Programme
ISI -	International Statistical Institute
ISME -	International Society for Microbial Ecology
IT -	Information Technology
IUMS -	International Union of Microbiological Societies

L

LPI -	Lunar and Planetary Institute
LRAD -	Land Redistribution for Agricultural Development

M

MCEE -	Minnesota Council on Economic Education
MDC -	Maputo Development Corridor
MEC -	Member of the Executive Council
MNS -	Material and Nanosciences Cluster
MOU -	Memorandum of Understanding
MRC -	Medical Research Council
MSA -	Masters in Sustainable Agriculture
MSSA -	Microscopy Society of Southern Africa
MUCPP -	Mangaung University Community Partnership Programme

N

NAMC - National Agricultural Marketing Council
 NASA - National Aeronautics and Space Administration
 NASSP - National Astrophysics and Space Science Programme
 NBN - National Bioinformatics Network
 NCEE - National Council for Economic Education
 NDF - Neutral Detergent Fibre
 NECSA - Nuclear Energy Corporation of South Africa
 NERPO - National Emergent Red Meat Producers Organisation
 NGO - Non-Governmental Organisation
 NRF - National Research Foundation
 NSTF - National Science and Technology Forum
 NWGA - National Wool Growers' Association

O

OECD - Organisation for Economic Cooperation and Development

P

PAQS - Pacific Association of Quantity Surveyors
 PDMS - Provincial Disaster Management Centre
 PRT - Protein Research Trust

R

RDP - Redress and Development Programme
 RIBA - Royal Institute of British Architects
 RICS - Royal Institute of Chartered Surveyors
 RIEP - Research Institute of Education Planning
 RMMA - Red Meat Abattoirs Association
 RPO - Red Meat Producers Organisation
 RTPI - Royal Town Planning Institute

S

SA - South Africa
 SAAPMB - South African Association of Physicists in Medicine and Biology
 SAB - South African Breweries Limited

SABC - South African Broadcasting Corporation
 SACAP - South African Council for the Architectural Professions
 SACPCMP - South African Council for the Property Valuers Profession
 SACPLAN - South African Council of Planners
 SACQSP - South African Council for the Quantity Surveying Profession
 SADC - Southern African Development Community
 SAFA - South African Feedlot Association
 SAFEFE - South African Foundation for Economic and Financial Education
 SAFOI - South African Fryer Oil Initiative
 SAIA - South African Institute of Architects
 SAIM - Society for Industrial and Applied Mathematics
 SAISC - Southern African Institute of Steel Construction
 SANBI - South African National Biodiversity Institute
 SANCID - South African Commission on Irrigation and Drainage
 SANPAD - South African Netherlands Research Programme on Alternatives in Development
 SANSA - South African National Survey of Arachnida
 SAPOA - South African Property Owners Association
 SAPPS - Symposium of the South African Pecan Producers Association
 SAQA - South African Qualifications Authority
 SASA - South African Statistical Association
 SASHS - Southern African Society for Horticultural Sciences
 SASM - South African Society for Microbiology
 SAWMA - South African Wildlife Management Association
 SAWSS - Southern African Weed Science Society
 SCM - Scientific Computing and Modeling
 SEG - Society of Economic Geologists
 SEM - Scanning Electron Microscope

SLE - Senior Lecturer Equivalent
 SSSSA - Soil Science Society of South Africa
 SWMA - Southern African Wildlife Management Association

T

TEM - Transmission Electron Microscope
 THRIP - Technology and Human Resource for Industry Programme

U

UCT - University of Cape Town
 UEC - Unit for Earth Construction
 UFS - University of the Free State
 UJ - University of Johannesburg
 UK - United Kingdom
 UN - United Nations
 UNESCO - United Nations Educational, Scientific and Cultural Organisation
 UNU - United Nations University
 UP - University of Pretoria
 USA - United States of America
 USAID - United States Agency for International Development
 UWC - University of the Western Cape

W

WCAP - World Conference on Animal Production
 WITS - University of the Witwatersrand
 WRC - Water Research Commission

