

UNIVERSITY OF PRETORIA
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

1. BIOGRAPHICAL SKETCH

1.1 GENERAL INFORMATION

Surname	Smith			Maiden name					
First names	Lelanie			ID Number					
Citizenship	South African			Title	Dr	Female	<input checked="" type="checkbox"/>	Male	<input type="checkbox"/>
Place of birth	Pretoria, South Africa			Date of birth	1984-07-27				
Population group	<input type="checkbox"/> African	<input type="checkbox"/> Coloured	<input type="checkbox"/> Indian	<input type="checkbox"/> White	<input checked="" type="checkbox"/>	Other (Please specify)			
Marital status	Single			Direct Telefax No.					
Direct Telephone	012 420 5366			E-mail	Lelanie.Smith@up.ac.za				

1.2 LANGUAGE PROFICIENCY

English (Read, write, speak)
 Afrikaans (Read, write, speak)
 German (Level A1, basic reading and writing)
 Norwegian (Level A1, basic reading and writing)

1.3 ACADEMIC QUALIFICATIONS OBTAINED

Degree/ Diploma	Field of study	Higher education institution	Period	Year of graduation	Distinctions
BEng	Mechanical and Aeronautical Engineering	University of Pretoria	2004 – 2007	2007	9

**Additional coursework credited for beyond the engineering degree: Numerical Analysis, Dynamical processes, Mathematical statistics (2 modules), Financial Management (2 modules), Economics (2 modules), Astronomy, Introduction to Poetry*

BEng (Hons)	Mechanical and Aeronautical Engineering	University of Pretoria	2008	2008	2
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**Subject focus: Numerical methods and optimisation, Numerical thermoflow, Advanced fluid mechanics and Advanced heat transfer*

MEng	Mechanical and Aeronautical Engineering	University of Pretoria in collaboration with the Council of Science and Industrial Research	2009 – 2011	2011	
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PhD	Mechanical and Aeronautical Engineering	University of Pretoria in collaboration with University of Southern California	2013 – 2017	2017	
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1.5 WORK EXPERIENCE TO DATE		
Name of employer	Capacity and/or type of work	Period
University of Pretoria, Mechanical and Aeronautical Engineering	Junior lecturer	2009
University of Pretoria, Mechanical and Aeronautical Engineering	Junior lecturer (part-time)	2010 – 2011
University of Southern California, Department of Aerospace and Mechanical Engineering	Lab assistant	March to July 2016
Council of Scientific and Industrial Research (CSIR)	Design team	Oct to Dec 2017
University of Pretoria (Department of Education Innovation)	Engineering Education advisor (Contract based)	Oct 2017 to Dec 2018
University of Pretoria, Mechanical and Aeronautical Engineering	Lecturer	03/2012 – 12/2019
University of Pretoria, Faculty of Engineering, Built Environment and IT	Senior Lecturer, Head of Community-based Projects for EBIT Faculty, Programme director of the Vertically Integrated Projects (VIP@Tuks)	11/2020 - currently

2. TEACHING AND LECTURING DUTIES

Course	Level (second year, etc.)	Academic Institution	Degree/ Diploma	Curriculum design
Innovation and Design	1	UP	BEng	Partly
Graphic Communication (Technical drawing and manufacturing)	1	UP	BEng	Yes
Community Engagement	2	UP	All EBIT programs	Yes
Thermo Flow (Fluid Mechanics)	3	UP	BEng	No
Design (Final year design project supervision)	4	UP	BEng	No
Project (Final year research project supervision)	4	UP	BEng	No

**Community Engagement course details: 1700 students across 18 programmes, leading to 350 projects that take place in communities over a course of 6 months.*

Educational courses attended	<p><u>Engineering</u> Practical Workshop Training (2004) Occupational Health and Safety Act Training (2013) NMISA Basic laser safety Training (2015) First Aid Level 1 and 2 (2015)</p> <p><u>Education</u> ClickUP training course (online course management) (2013) Assessment Workshop for Academics (2013) SASSEE Workshop on Engineering Education for the 21st century (June 2018) Seventh engineering education “master-class” workshop: Large Class Teaching in a Multi-Cultural, Multi-Ability & Multi-Disciplinary Setting (2019) Eight engineering education “master-class” workshop: Fostering Inclusivity in Engineering Education in the South African Context (2019) Interactive video as a teaching tool (2020)</p> <p><u>Management and personal development</u> Neuro-success with Dr Ian Weinberg (2013) Enneagram (Personality typology and typing; Certification training to facilitate groups and individuals) (2016 – 2018) Logotherapy (2017) Tension and trauma releasing exercises (Certification training to facilitate groups and individuals) (2018) Cultivating compassionate listening (2019) Introduction to Focusing by The London Focusing institute (2019)</p>
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3. RESEARCH

RESEARCH FIELD	SPECIALITY
Computational Fluid Dynamics Engineering Design Education	Applied Aerodynamics Co-curricular Multi-disciplinary Vertically Integrated Projects

3.1 RESEARCH DUTIES

3.1.1. Former supervision or co-supervision (completed)			
Name of student	Degree/Title of dissertation/ thesis and date	Supervisor/ Co-supervisor(s)	Duration of studies (years)
M Kruger	MEng: Applying the gull-wing fuselage configuration to a wide body airliner (2014)	Prof JP Meyer Dr L Smith Mr RJ Huysen	2
NE Mutangara	MEng: Numerical Implementation of the Power Balance Method for Aerodynamic Performance Assessment (2021)	Dr L Smith Prof KJ Craig Dr DS Sanders	2

L Fels	MSc: Design and Development of landing device and test procedure to verify flight performance of a UAV (2019)	Dr L Smith Prof A Strohmayer (Stuttgart University, Germany)	1
F Will	MSc: Redesign and optimization of the AREND UAV for stable and efficient flight (2020)	Dr L Smith Prof A Strohmayer (Stuttgart University, Germany)	1
B Bjerke	MSc: Numerical investigation of alternative self-stable wing for the AREND UAV (2020)	Dr L Smith Dr GB Mauseth (University of Tromsø, Norway)	1
A Sharma	MEng: Investigation of a new UAV configuration with non-elliptic lift Distribution (2022)	Dr L Smith Dr MM Lone (Cranfield University)	2
LD Fouellefack	MEng: Development of a Novel Supervisory Controller on a Parallel – Hybrid Powertrain for Small Unmanned Aerial Systems (2022)	Dr L Smith Dr M Kruger (University of Southern California)	2

3.1.2. Current supervision or co-supervision

Name of student	Degree/Title of dissertation/ thesis and date	Supervisor/ Co-supervisor(s)	Duration of studies (years)
C Niebuhr (Part-time)	PhD: Quantifying the downstream turbulence intensity and recovery of an axial flow hydrokinetic turbine using validated CFD models	Dr L Smith (co-supervisor)	2
DU Odendaal (Part-time)	MEng: Optimization of a Commercial Fuselage for Improved Aerodynamic Efficiency and Energy Recovery Potential	Dr L Smith Prof KJ Craig	2
J Schoombie	PhD: The effect of changing wind on the flight capabilities of the Grey-headed Albatross	Dr L Smith Prof KJ Craig	1
R Raubenheimer	MEng: Analysis of Energy Outflow in Simple Lifting Bodies Using the Power Balance Method	Dr L Smith Dr DS Sanders	1
S Hamman (Part-time)	MEng: Computational analysis of aerodynamic stability of the Grey-headed albatrosses for the purpose of practical drone application	Dr L Smith Ms J Schoombie	2
A Winter	BEng (Hons): Grey Headed Albatross Aerodynamics and toward a bio-inspired flexible wing	Dr L Smith Ms J Schoombie	1
L Phiri	BEng (Hons): Optimisation of airframe propulsion integration	Dr L Smith Dr DS Sanders Mr NE Mutangara	1
M Mothomogolo	BEng (Hons): Application of PBM to propulsion	Dr L Smith Dr DS Sanders Mr NE Mutangara	1

B Mokoka	PhD: The impact of project-based, self-directed learning on the social responsibility attitudes of engineering students	Dr L Smith Prof K Wolff Dr L Bertel	1
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3.1.3. Obtaining research funds

Origin of research funds	Title of research project or program	Duration	Money allocated (R)
Study Abroad Research Grant, DRIS, UP (2013)	Collaborative aerospace research with the University of Southern California	6 weeks	R60 000
Fluxion (Arm Scor) (2014)	Aerodynamic investigation of an oval fuselage body shape	1yr	R16 000
Matomo (2014)	Investigation of the optimum layout of a wind farm	1yr	R20 000
Arm Scor (Fluxion) (2015)	Investigation of the impact of the trailing edge truncation on an airfoil for aerodynamic performance	1yr	R32 000
Knowledge interchange and collaboration funding (KIC) NRF (2015)	Optimisation of a wing-body-tail configuration with an alternative low drag fuselage and body trailing edge	2 weeks in 2015	R30 000
Staff Exchange Funding, DRIS, UP (2015)	Particle image velocimetry training at the University of Southern California	3months in 2015	R50 000
PhD Completion Funding, University of Pretoria (2016)	Investigation of a modified low-drag body for an alternative wing-body-tail configuration	1yr	R60 000
Staff Exchange Funding, DRIS, UP (2017)	Boundary layer ingestion and airframe propulsion integration at Cranfield University	6 weeks in 2017	R50 000
NRF Thuthuka Funding (2019)	Airframe propulsion integration	1 yr	R274 000
SASSEE Funding	AREND Project	1yr	R50 000
TSP Royal Society Funding	Integrated Curriculum Development	3yrs	171 000GBP
GDED-CAMASA	Gauteng Drone Competition and Challenge	6months	R100 000

3.2 RESEARCH OUTPUT

3.2.1 Publications in refereed accredited journals

Smith, L., Oxtoby, O.F., Malan, A.G. and Meyer, J.P., 2013. "An interactive boundary layer modeling methodology for aerodynamic flows," <i>International Journal of Numerical Methods for Heat and Fluid Flow</i> , Vol. 23, No. 8, pp. 1373 – 1392. (Impact factor: 2.14)
Smith, L., Craig, K.J., Meyer, J.P. and Spedding, G.R., 2016. "Modifying low-drag bodies to generate lift: a computational study," <i>Journal of Aircraft</i> , Vol. 54, No. 3, pp. 1150–1161. (Impact factor: 0.84)
Tank, J., Smith, L. and Spedding, G.R., 2016. "On the possibility (or lack thereof) of agreement between experiment and computation of flow over wings at moderate Reynolds numbers," <i>Interface Focus</i> , Vol. 7, Iss. 1, pp. 1 – 15. (Impact factor: 3.165)
Smith, L., Craig, K.J., Meyer, J.P. and Spedding, G.R., 2019. "Numerical investigation of the aerodynamic performance for an alternative wing-body-tail configuration," <i>Journal of Aircraft</i> , Vol. 56, No. 1, pp. 250 - 261. (Impact factor: 0.84)
Mutangara, N.E., Smith, L., Sanders, D.S. and Craig, K.J. 2021. "Potential for Energy recovery of unpowered configurations using power balance computations", <i>Journal of Aircraft</i> , Vol 58, No 6, pp1364-1374. (Impact factor: 0.84)

Niebuhr, C.M.; Hill, C.; Van Dijk, M.; Smith, L. Development of a Hydrokinetic Turbine Backwater Prediction Model for Inland Flow through Validated CFD Models. *Processes* 2022, 10, 1310. (Impact Factor: 2.75)

C.M. Niebuhr, S. Schmidt, M. van Dijk, L. Smith, V.S. Neary, A review of commercial numerical modelling approaches for axial hydrokinetic turbine wake analysis in channel flow, *Renewable and Sustainable Energy Reviews*, Volume 158, 2022, 112151, (Impact factor: 14.98)

3.2.2 Papers accepted for publication in refereed accredited journals

Fouellefack, L.D., Kruger, M and Smith, L., "Development of a Novel Supervisory Controller on a Parallel-Hybrid Powertrain for Small Unmanned Aerial Systems", *Aircraft Engineering and Aerospace Technology*, 19 Feb 2022, manuscript AEAT-02-2022-0054

3.2.3 Papers submitted for publication in refereed accredited journals

Sharma, A., Lone, M.M and Smith, L. "Investigation of a new UAV configuration with non-elliptic lift Distribution", *The Aeronautical Journal*, 18 Feb 2022, manuscript AeroJ-2022-0031

3.2.4 Papers in preparation for publication in refereed accredited journals (order of anticipated readiness)

Odendaal, D.U., Craig, K.J., Sanders, D.S. and Smith, L., Optimization of a Commercial Fuselage for Improved Aerodynamic Efficiency and Energy Recovery Potential, *Journal of Aircraft*.

Mutangara, N.E., Smith, L., Sanders, D.S. and Craig, K.J. Potential for Energy Recovery from Boundary Layer Ingesting Actuator Disk Propulsion. *Journal of Aircraft*.

Schoombie, J., Schoombie, S., Ryan, P.G., Craig, K.J., Smith, L., Shepard, E., Wind-induced collision mortality in grey-headed albatrosses (*Thalassarche chrysostoma*) breeding on Marion Island. *Science Advances* (Impact Factor 14.13)

Smith, L and Eybers, S. Impact of experiential co-curricular project-based learning on students work readiness. *European Journal of Engineering Education*.

Odendaal, D.U., Craig, K.J., Sanders, D.S. and Smith, L., Approach validation towards optimization of a Commercial transonic Fuselage, *Journal of Aircraft*

Smith, L., van der Merwe, A., Matthee, M., Matthee, N and Liebenberg, J., "Impact of technology as scaffolding for Mind, Brain and Education principles in order to support at-risk students in a first-year engineering drawing course," (Undecided)

3.2.5 Papers presented and published in international conference proceedings

Smith, L and Trent, M.N., A co-curricular framework for a multinational, vertically integrated engineering design project, *ASEE Annual Conference & Exposition.*, 26-29 July 2021.

Smith, L., Spedding, G.R. and Meyer, J.P., "Numerical and laboratory experiments on a new wing-body-tail configuration," *54th AIAA Aerospace Sciences Meeting*, AIAA SciTech, AIAA 2016-0800, San Diego, CA, 4 –8 Jan 2016.

Koster, J.N., Buysse, A., Smith, L., Huyssen, J.R., Hotchkiss, J., Malangoni, J. and Schneider, J., "AREND: A sensor aircraft to support wildlife rangers," *57th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, AIAA SciTech, AAIA 2016-0827, San Diego, CA, 4 – 8 Jan 2016.

Smith, L., Craig, K.J., Meyer, J.P. and Spedding, G.R., "Optimisation of a wing-body-tail configuration with an alternative low drag fuselage and body trailing edge," *30th Congress of the International Council of Aeronautical Sciences*, ICAS 2016-0223, Daejeon, 25 – 30 Sept 2016.

Smith, L., Koster, J.N. and Schneider, J., "Experience with international collaborative aircraft design education: AREND UAV," *31st Congress of the International Council of Aeronautical Sciences*, ICAS 2018-0217, Belo Horizonte, 9-14 Sept 2018.

3.2.6 Papers in preparation for international conference proceedings

Smith, L., Sharma, A., Odendaal, D.U., Bjerke, B., Schneider, J., Will, F., Fels, L and Chamier, J. "International UAV vertically integrated design projects to inform curriculum renewal" AIAA Aviation Forum, Chicago 27 Jun – 1 July 2022.

Raubenheimer, R., Sanders, D.S and Smith., L. "Characterization of Wake Recoverable Energy Downstream of A Simple Finite Wing in the Context of Formation Flight" AIAA Aviation Forum, Chicago 27 Jun – 1 July 2022.

Mutangara, N.E., Smith, L., Craig, K.J., and Sanders, D.S., "Potential for Energy Recovery from Boundary Layer Ingesting Actuator Disk Propulsion" AIAA Aviation Forum, Chicago 27 Jun – 1 July 2022.

Odendaal, D.U., Smith, L., Craig, K.J., and Sanders, D.S., Fuselage Optimization Study for Improved Recoverable Energy for Effective Boundary Layer Ingestion" AIAA Aviation Forum, Chicago 27 Jun – 1 July 2022.

3.2.7 Conference papers presented (but not published)

Smith, L., Oxtoby, O.F., Malan, A.G. and Meyer, J.P., "Efficient modeling of aerodynamic flows in the boundary layer for high performance computing," 2nd *International Aerospace Society of South Africa*, Gordons Bay, South Africa, 23 – 25 Nov 2010.

Smith, L., Oxtoby, O.F., Malan, A.G. and Meyer, J.P., "An interactive boundary layer modeling methodology for aerodynamic flows," *ASME, Mechanical Engineering Congress*, Denver, CO, 11 – 17 November 2011.

Smith, L., Craig, K.J., Meyer, J.P. and Spedding, G.R., "Investigation of a low drag body for an alternative wing-body-tail configuration," *International Aerospace Society of South Africa*, Stellenbosch, South Africa, 14 – 16 Sept 2015.

Smith, L., Huysen, R.J., Buysse, A. and Koster, J.N., "AREND – A Globally Designed Sensor UAS to Combat Wildlife Poaching," *International Aerospace Society of South Africa*, Stellenbosch, South Africa, 14 – 16 Sept 2015.

Smith, L., "AREND UAV: An engineering design education project," *Aeronautical Society of South Africa Annual Conference*, Somerset-Wes, South Africa, 24-26 Oct 2018.

Smith, L., "Challenges and solutions in an international collaborative aircraft design education project," *REES*, Cape Town, South Africa, 10-12 Jul 2019.

Matthee, N., Smith, L., van der Merwe, A., and Liebenberg, J., "Using technology as scaffolding for a Mind, Brain and Education aligned learning intervention: An MGC110 case study," *Flexible Futures: Higher Education Innovation Conference and Expo*, Pretoria, South Africa, 9 – 10 September 2019.

Smith, L and Trent, M.N., "Student and staff experience of an interdisciplinary, multi- national co-curricular aerospace design project", 8th International Research Symposium on PBL, Paper 82, Aalborg University, Aalborg, Denmark, 28 October 2020.

Smith, L., Inglis, H., van der Merwe, A., Simpson, Z., von Klemperer, C., Govender, R., Wolff, K., Tshitshonu, E., and Mitchell, J. "Bringing Life to Engineering Education: Starting the conversation about Integrated Curricula" 7th *Flexible Futures: Higher Education Innovation Conference*, 26-27 August 2021.

3.2.8 Conference papers (co-author)

Kruger, M., Huysen, R.J, Smith, L. and Meyer, J.P.' "Application of a low fineness ratio fuselage to an airliner configuration," 54th *AIAA Aerospace Sciences Meeting*, AIAA SciTech, AIAA 2016-1282, San Diego, CA, 4 –8 Jan 2016.

Claassen, C., Matthee, N., Van der Merwe, A., Matthee, M. and Smith, L., "Using technology as scaffolding for Mind, Brain and Education principles to support at-risk engineering students," *Flexible Futures: Higher Education Innovation Conference and Expo*, Pretoria, South Africa, 4 – 5 October 2018.

Mutangara, N.E, Smith, L. and Craig K.J. "Numerical implementation of the Power Balance Method for Boundary Layer Ingestion," *Aeronautical Society of South Africa Annual Conference, AeSSA2019-02*, Pretoria, South Africa, 16-18 Oct 2019.

Lee, M.H., Smith, L. and Craig K.J. "Analysis of Power Balance Methodology for Propulsion integration system," *Aeronautical Society of South Africa Annual Conference, AeSSA2019-20*, Pretoria, South Africa, 16-18 Oct 2019.

3.2.9 Books / Textbooks Revisions

Smith L and Meeser RF. Graphical Communication. (Not for Mechanical and Industrial Engineers) *Department of Mechanical and Aeronautical Engineering. Wiley Custom. 2015.*

4. OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

4.1 Participation in conferences, workshops and short courses – specify type of contribution:

4.1.1 National

Smith, L. "Aircraft for Rhino and Environmental defense," *Commercial Unmanned Aircraft Association of Southern Africa meeting, Africa Aerospace and Defense Expo, Centurion, South Africa, 17 – 19 September 2014.*

Smith, L. "International collaborative, vertically integrated aircraft design education: AREND UAV," *Electronic warfare South Africa 2017 – International conference and exhibition, Pretoria, 6-8 Nov 2017.*

Smith, L., "The advantages and challenges of the use of CFD to assist with experimental evaluation," *Star conference South Africa, Centurion, South Africa, 19 – 20 Sept 2016.*

Smith, L. "Update and future plan for the AREND UAV design education project," *4th UAV Forum, Pretoria, 29 Nov 2017.*

Smith, L. "Status and role of the AREND Project in SA," *DroneCon, Midrand, 17 May 2018.*

Smith, L. "Networking," *DPSS youth forum lecture series, Council of Scientific and Industrial Research, Pretoria, 24 July 2018.*

Smith, L and Mitchell, J. Session 1: 27 January 2022. What is an Integrated Curriculum? And how does it bring life? Royal Academy of Engineering – Bringing Life to our Engineering Curricula initiative (Online) <https://iecurricula.co.za/>

Smith, L and Wolff, K. Session 4: 10 March 2022 Sustainable Integration. Royal Academy of Engineering – Bringing Life to our Engineering Curricula initiative (Online) <https://iecurricula.co.za/>

Smith, L, Wolff, K, Inglis, H and Hattingh, T. Session 5: 7 April 2022. Cultivating Life: how do we make our integrated curriculum ideas reality? Royal Academy of Engineering – Bringing Life to our Engineering Curricula initiative (Online) <https://iecurricula.co.za/>

Smith, L, Inglis, H and Fourie, J. Facilitating active, experiential learning in your classroom. SASEE Engineering Education Seminar. 12 July 2022.

4.1.2 International

Smith, L., Buysse, A. and Koster, J.N., "AREND – A Globally Designed Sensor UAS to Combat Wildlife Poaching," *AIAA SciTech, Kissimmee, FL, 5 – 9 January 2015 [Co-presenter and panel member].*

Smith, L., "A global collaborative education project to design a UAS to prevent wildlife poaching," *7th EASN International Conference on Innovation in European Aeronautics Research, Warsaw, Poland, 26-29 Sept 2017.*

Klassen, M., Guerra A. and Smith, L., "Agency building for EER in African Countries," *The Big Engineering Education Meet Up*, Virtual Meeting 14 May 2020.

Smith, L and Matemba, E. 2020. *African Engineering Education Research Network (EERN)*. WEEF/GEDC 2020: World Engineering Education Forum and the Global Engineering Deans Council. 2020.

Smith, L and Broadbent, R. 2020. *Exhaustion and Authenticity in your career as an academic staff member*. WEEF/GEDC 2020: World Engineering Education Forum and the Global Engineering Deans Council. 2020.

4.2 Teamwork and collaboration with others (please specify):

Collaborative research with University of Southern California (USC) in the USA on "Wind tunnel investigations viscous/inviscid interactions in standard and novel aircraft configurations" using PIV technologies (2013 – 2016)

Team leader for international research group AREND to develop UAV solutions for SANParks (2014 – 2021) Universities involved are University of Stuttgart (Germany), Helsinki Metropolia (Finland) and Colorado University (US). Two Erasmus + formal agreements (*in progress*) with VGTU, Lithuania and UiT in Norway.

Bilateral agreement (*In progress*) with Cranfield University in the UK on "Development of novel highly integrated multi-physics and numerically based methods that will be used for the aerodynamic modelling, analysis and assessment of future integrated propulsion systems" (2019-2024)

Memorandum of Agreement with University of Cape Town for Fuel Cell application in Drones (2019 -2023)

Project Collaborator on SARex polar code solutions for evacuation strategies with University of Tromso, Norway (2021-2023)

TowerWing Collaboration: Advisory Board member and UP institutional link (2021-)

Principle Investigator for Bringing life to our Engineering Curricula project across all SA HEI (2021 – 2023) National Team includes: Prof John Mitchell (UCL); Prof Karin Wolff (SASEE, SUN); Prof Teresa Hattingh (NWU, REEN Chair); Dr Helen Inglis (UP); Dr Zach Simpson (UJ); Prof Chris von Klemperer (UCT); Dr Reuben Govender (UCT); Mr Eudes Tshitshonu (VUT)

CAMASA-GDED Drone competition. Collaboration with WITS and Aerial Monitoring Solutions (2022)

4.3 Membership of national and international bodies

Member of The American Institution of Aeronautics and Astronautics (2014 – 2022).

Member of Woman in Aviation International (2016 – 2022).

Member and UP representative at the Joint Aerospace Steering Committee (2018 – 2022)

Member of SASEE (2018 – 2022)

4.4 Visits to local and overseas universities or research institutes as guest professor or researcher

Scholar exchange program with University of Southern California (USC), LA, California, USA to set up PhD collaboration research projects and receive basic training in particle image velocimetry (PIV) (July/August 2013).

Staff exchange program with USC on PIV post processing software simulation and CFD simulation support (Nov 2014 to Feb 2015).

PhD academic development program to USC to complete wind tunnel testing and final write up of PhD. Part-time work as lab assistant in the AME labs at USC (2016).

UAV Design team member at the CSIR (Oct to Dec 2017).

Engineering education advisor for development of intervention materials for Graphical Communications. Contract based work for the University of Pretoria (Department of Education Innovation) (Oct 2017 to Dec 2018).

Research exchange to the hybrid propulsion group (Dr P Laskaridis) at Cranfield University, UK on airframe propulsion integration topics to facilitate collaboration with UP. Dec 2017 to Jan 2018 and Nov 2019 to Jan 2020.
Collaborative engagement visits to Vilnius Technical University in Vilnius, Lithuania to facilitate both research and educational collaborative projects (June 2018)
Collaborative engagement visits to University College London in London, UK to observe and discuss integrative curriculum potential at UP (Nov 2019)
Collaborative engagement visits to Aalborg University in Aalborg, Denmark to determine collaboration on future curriculum applications potential at UP (Jan 2020)
Interview with innovative curriculum initiatives at UJ, WITS, CPUT, UCT, SUN, NMU, WSU and NWU (Feb – May 2022).

4.5 Mentorship and supervision of international students			
<i>Student</i>	<i>Level and University</i>	<i>Advisors</i>	<i>Year</i>
J Schneider	MEng (Stuttgart University, Germany)	Prof A Strohmayer Dr L Smith Mr RJ Huysen	2014
A Buysse	MEng (Colorado University, USA)	Prof J Koster Dr L Smith	2015
L Fels	MEng (Stuttgart University, Germany)	Prof A Strohmayer Dr L Smith Mr J Schneider	2017/2018
A Carriquabure	Intern, École Nationale Supérieure de Mécanique et d'Aérotechnique (ENSMA)	Dr L Smith	2018
T Labourdette	Intern, École Nationale Supérieure de Mécanique et d'Aérotechnique (ENSMA)	Dr L Smith	2018
F Will	MEng (Stuttgart University, Germany)	Dr L Smith Mr J Schneider	2019
B Bjerke	MEng (UiT, Norway)	Dr L Smith Mr G Mausbeeri	2020

4.6 Coordination of graduate short courses
Flight Mechanics, presented by Dr MM Lone from Cranfield University's Aircraft Integration Research Centre, a Centre jointly funded by Airbus, Rolls Royce, the Higher Education Funding Council for England (2019-2020).
Unmanned Aerial Systems Technology by Mr P Barrier graduated as aeronautical engineer from the French "Ecole Nationale Supérieure de l'Aéronautique et de l'Espace" (2019-2020).

4.7 Internal and External Examinations			
<i>Student</i>	<i>Level and University</i>	<i>Title</i>	<i>Year</i>
A Saligram	MSc Mechanical Engineering (WITS)	Design and verification of a controlled induced mass flow system	2018

A Beneke	MEng Mechanical and Aeronautical Engineering (UP)	The simultaneous optimization of the nose and tail geometry of a high-speed train for drag and crosswind stability	2018
JP Theron	MEng Mechanical and Aeronautical Engineering (UP)	Practical implementation of a trajectory planning algorithm for an autonomous UAV	2018
N Mthembu	MSc Mechanical Engineering (NWU)	Turbulent wake influence on sailplane performance	2018
S Poprawa	PhD Mechanical and Aeronautical Engineering (UP)	Statistical approach to payload capability forecasting for large commercial aircraft operating payload range limited routes	2019
V Le Roux	MSc Mechanical Engineering (NWU)	CFD airfoil profile drag calculation using far-field wake analysis	2019
E Wium	MEng Mechanical Engineering (Stellenbosch)	Design, Manufacture and Hydrodynamic Evaluation of a Prototype Tri-leaflet Mechanical Heart Valve for Aortic Valve Replacement	2020
AJ Ham	MEng Mechanical Engineering (Stellenbosch)	Morphing Technologies Design Toolbox and application to hydrofoil design	2021

4.8 H-index and citations

Scopus Profile: H-index 3 with 51 citations.

Google Scholar Profile: H-index 4 with 105 citations.

5. AWARDS

5.1 Research Awards

Technical Design Education Committee Award for best paper and presentation in Innovative design and education. Awarded at the AIAA SciTech Conference in San Diego, CA in 2016 for the presentation and paper titled “AREND: A sensor aircraft to support wildlife rangers”.

5.2 Teaching Awards

Faculty of Engineering, Built Environment and IT Teaching and Learning Excellence Award (2017)
Management and coordination of the international design education project, Team AREND.

Finalist for the GEDC Diversity Award for the AREND project (2020)

VIP Consortium Innovation Competition second place for Team AREND (2021)

6. MANAGEMENT AND ADMINISTRATIVE DUTIES (LEADERSHIP)

List your involvement in departmental activities (e.g. administrative functions), faculty (e.g. faculty committees) or other university activities
Marketing Committee (2012 – 2017) with specific duties of arranging industry visits (2012 – 2013) and organizing Engineering Week (2013 – 2017). Development of the marketing strategy for the Aeronautical Engineering visits.
Coordination and facilitation of the delegation from VGTU (Vilnius Technical University) collaborative visit to the Department of Mechanical and Aeronautical engineering at UP (July and Nov 2018).
Department of Mechanical and Aeronautical engineering coordination of Aeronautical post graduate track with industry and research group needs. Subject alignment and hybrid teaching in the post graduate track (2017 – 2019).
Development and coordination of the AREND UAV team. Project manager and team leader of the multi-disciplinary, multi-national vertically integrated project, integrated and credit into the Mechanical and Aeronautical Engineering undergraduate program (2014 – 2022).
Faculty of Engineering, Built environment and IT Curriculum Transformation committee (2017 – 2021) Chair of the committee from October 2020 – Dec 2021.
Faculty of Engineering, Built environment and IT Curriculum Development Committee Founder/Chair (2022 -)
Faculty coordinator of the Vertically Integrated Projects (VIP) initiative (2020 -).
Technical Program Committee member for the Online World Engineering Education Forum (WEEF) with responsibilities of workshop coordination and technical program coordination (2020; 2022).
Coordinator of the African Engineering Education Research Network initiative (2020 -)
National Team Leader: Bringing Life to our Engineering Curricula (2021 -)
Technical Coordinator for the Gauteng Hub during the National Hybrid SASEE Engineering Education Seminar, 12 July 2022.