Water and Environmental Engineering Research Topics 2024

Supervisor(s)	Degree	Preliminary title of research project	Brief description of project	Scholarship per year
Prof JA du Plessis	MEng (R)	Evaluation of the performance of a newly developed distribution (IPZA)	Evaluate the newly developed distribution for annual flood peaks, using short record lengths	
Prof JA du Plessis	MEng (R)	Evaluate the performance of the IPZA ditribution for the estimate of AEP>50%	Extensive analysis was done on the preformace of the GUSSA distribution to estimate flood peaks for AEP < 50%, but th eperformance for flood peaks with an AEP<50% need further evaluation	
Prof JA du Plessis	MEng(R)	Quantify the difference between the use of AMS vs PDS in flood estimations	Invetigate th edifference in the estimation of flood peaks using an annual maximum series vs that of a partial duration series.	
Prof JA du Plessis	MEng(R)	Investigate the increase in rainfall intensity in SA as a result of Climate change	Climate change models predict an increase in rainfall intensity but less rainfall for the Western Cape. Analise a representative set of rainfall data to test this prediction	
Prof JA du Plessis	MEng(R)	Investigate the difference in surity of supply of a water supply system between daily and monthly runoff modelling	It is expected that the difference between the use of daily data vs the use of monthly data might have a significant impact on the available yield from specifically smaller water supply systems. Use a number of case studies to test this.	
Prof JA du Plessis	MEng(R)	Investigate the long term impcat of veldfires on runoff and peak flows.	Veldfires significantly change the characteristics of a catchment and the associated rainfall/runoff reposnse. Use two test sites to quientify these impacts.	
Prof JA du Plessis	MEng(R)	Investigate the impact of the Z-set plotting positions on the selection of a representative distribution	The newly developed Z-set plotting position will result in extreme events being represented on a more realistic base. This will inpact the selection of appropriate distributions. Evaluate the impact theroff on the design flood estimation for a wide range of probabaility of occurances an dcatchment size.	
Dr Andre Theron	MEng[R]	Theme: Waves, water-levels, climate change	Potential effects of global warming on the regional deep-water wind and wave regimes off the SA East coast & Moz.	
Dr Andre Theron & Prof Hardus Diedericks	MEng[R]	Theme: Waves, water-levels, climate change	Potential climate change effects on near-/in-shore wave climates through numerical modelling.	
Dr Andre Theron & Prof Hardus Diedericks	MEng[R]	Theme: Waves, water-levels, climate change	Assess and compare 3 wave models: SWAN, CMS Wave & ST Wave. (Why do these models give different results & which is most correct to use for design-waves (10- and 50-year return periods).)	
Dr Andre Theron	MEng[R]	Theme: Sediment transport & Coastal processes	Coastal processes & shoreline dynamics along parts of CoCT (including fieldwork: grain sizes, slopes, runup? - need own transport)	
Dr Andre Theron	MEng[R]	Coastal & Port Engineering - Themes: Waves, water-levels, climate change; Marine Structures; Shipping, ship motions, ports/harbours; Estuaries; Hydrodynamics, water quality, dilution and outfalls	The above are examples of Port & Coastal Eng. Master's topics; students may also propose their own topic, subject to approval by the supervisors. Potential themes within this field of study include: Waves, water-levels, climate change; Marine Structures; Shipping, ship motions, ports/harbours; Estuaries; Hydrodynamics, water quality, dilution and outfalls	