

## **Programme: PhD: Chemical Engineering (NQF 10) P6CHEQ**

### **Purpose of the qualification**

The purpose of the qualification is to develop an engineer with advanced abilities in applying fundamental engineering sciences and/design and synthesis, and related principles independently to specific problems of society at large. One of the main objectives in this process is to develop an advanced capability to conduct fundamental engineering research of an original nature. It also promotes a lifelong learning approach and an aptitude for training other students in similar fields.

### **Admission requirements and selection criteria**

- An approved master's degree in Engineering or a similar approved degree at master's level.
- Supervisor's signed proposal.
- Final admission to the programme will only be granted upon successful presentation of a research seminar six months after enrolment. Research topics must also be accepted and approved by the supervisors in the Faculty and finally by the Senate or Executive Committee of the Senate of the University.

### **Outcome**

- Identify, assess, formulate, interpret, analyse and solve engineering research/development problems of an original nature creatively and innovatively by applying relevant advanced fundamental knowledge of i.e. Mathematics, Basic Science and Engineering Sciences in the chosen field of research.
- Plan and manage advanced research projects, demonstrating fundamental knowledge, understanding and insight into the principles, methodologies and concepts that constitute socially responsible (to local and other communities) engineering research/development in the chosen field of research practice.
- Work effectively, individually or with others, as a member of a team, group, organisation and the community or in multi-disciplinary environments in the chosen field of research.
- Organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically, accept responsibility within his/her limits of competence, and exercise original judgment based on knowledge and expertise, pertaining to the field of research.
- Plan and conduct advanced investigations, research and/or experiments of an original nature by applying or developing appropriate theories and methodologies and perform appropriate data analysis and interpretation.
- Communicate effectively, both orally and in writing, with engineering and specifically research audiences and the community at large, in so far as they are affected by the research, using appropriate structure, style and graphical support.
- Use and assess appropriate advanced inter-disciplinary research methods, skills and information technology effectively and critically in engineering research/development practice and show a responsibility for the impact of engineering research/development activities on society and the environment.

- Perform procedural and non-procedural design and synthesis of components systems, works, products or processes as a set of related systems and assess their social, legal, health, safety and environmental impact and benefits, where applicable, in the chosen field of interdisciplinary research.
- Employ various learning and research strategies and skills to master outcomes required for preparing him/herself to engage in continuous learning and research, to keep abreast of knowledge and skills required in the engineering management research/development field.
- Participate as a responsible citizen in the life of local, national and global communities by acting professionally and ethically in the chosen field of research.
- Demonstrate, where applicable, cultural and aesthetic sensitivity across a range of social contexts in the execution of engineering research/development activities.
- Explore, where applicable, education and career opportunities in advanced engineering research/development.
- Organise and develop, where applicable, entrepreneurial opportunities through engineering, technical research, development and/or managerial skills