

FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT



UNIVERSITY
OF
JOHANNESBURG



Postgraduate Programme: **Master of Systems Engineering M(SysEng)**

The Future
Reimagined

POSTGRADUATE PROGRAMME: MASTER OF SYSTEMS ENGINEERING M(SYSENG)

The Master of Systems Engineering programme strives to develop professionals with advanced abilities in applying fundamental systems engineering sciences and related interdisciplinary principles enabling them to contribute as advanced Systems Engineers.

The Master of Systems Engineering Programme focus on the development of professionals for System Engineering leadership roles in engineering and related technology fields.

WHAT ARE THE OUTCOMES OF THE MASTER OF SYSTEMS ENGINEERING PROGRAMME?

- Identify, assess, formulate, interpret, analyse and solve Systems Engineering problems creatively and innovatively by applying relevant fundamental knowledge of i.e. mathematics, science and engineering sciences.
- Plan and manage Systems Engineering research demonstrating an underlying 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.
- Organise and manage him/herself and his/her activities responsibly, effectively, professionally and ethically and take responsibility within his/her own limits of competence and to exercise judgment commensurate with knowledge and expertise.
- Use and assess appropriate Systems Engineering research methods, skills, tools, technology and information technology effectively and critically in engineering research/development practice and show an understanding and a willingness to accept responsibility for the impact that engineering research/development practice have on society and the environment.
- Employ various learning strategies and skills to master outcomes required in preparing him/herself to engage in continuous learning to keep abreast of knowledge and skills required in the Systems Engineering field.
- Participate as a responsible citizen in the life of local, national, and global communities by acting professionally and ethically.

WHAT WILL THE MASTER OF SYSTEMS ENGINEERING PROGRAMMES OFFER YOU?

- Advanced capability to conduct fundamental independent systems engineering research.
- The ability to apply research tools and techniques on systems engineering problems in the real-world.
- Advanced knowledge and skills to integrate engineering and systems engineering principles to solve complex problems.
- Skills to conduct systems engineering activities such as systems design, planning, research and problem solution.

WHO CAN APPLY?

Applicants holding a four-year Bachelor's degree or NQF level 8 equivalent from programmes within engineering or Bachelor of Technology that is supported by considerable research experience and postgraduate learning or work experience at NQF level 8. At least two years work experience in a technology field is required.

INTERNATIONAL STUDENTS?

The University of Johannesburg welcomes international students.

HOW TO APPLY?

All applications to be completed online. To apply for the Master of Systems Engineering programme, please follow the application link on the UJ website www.uj.ac.za

MASTER OF SYSTEMS ENGINEERING PROGRAMME:

The duration of the programme is two years. The mode of delivery for the programme is through contact sessions supported by self-study and a research minor dissertation.

The first year contains the coursework part of the program which consists of six compulsory modules with the second year spend on the research component.

The modules have been designed to provide skills and knowledge development across four dimensions: i) Systems Engineering, ii) Engineering Management, iii) Engineering Principles, iv) Research Capability

MODULES:

- **Systems Engineering**
The Systems Engineering principles in the application to engineering.
- **Engineering Systems Management**
The application of systems engineering management principles in the development of engineering systems.
- **Engineering Mathematics and Computing**
The application and practice of advanced engineering mathematical and computing techniques including, numerical analysis, Optimization, Modelling and scientific programming and uncertainty and stochastic analysis.
- **Product Development and Marketing**
Technology management principles related to the engineering product development process.
- **Reliability Management**
Technology management principles related to reliability management in the engineering product life-cycle from development through operation to phase-out and disposal.
- **Cyber Systems**
The principles of cybersecurity in systems and its involvement in technology, people, information and processes to enable assured operations in the context of adversaries.

The lectures relate the theory to the students by using case studies and problems from industry to enable students to integrate the knowledge to real-life problems.
- **Minor Dissertation:**
Students will select a relevant topic from the domain of Systems Engineering to research and report upon in the form of a minor dissertation and an academic publication.

CONTACT INFORMATION:

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