



# MANuS

Masters in Accelerator and Nuclear Science

Masters Programme  
in Scarce Skills



## Masters Programs in Scarce Skills

### MANuS

(Masters in Accelerator and Nuclear Science)

#### Aims

To offer an academic and practical course at MSc level to enable graduates, from a wide range of undergraduate science and related degrees, to enter industry and government with appropriate skills or to progress to a doctorate qualification (Ph.D).

#### Structure

A two year course, with lectures/practicals in the first year and research project in the second year.

#### First Year

Lectures at the University of Western Cape (UWC) Campus, Cape Town.

Practicals and Projects at the neighbouring iThemba Laboratory for Accelerator Based Sciences (iThemba LABS). Written examination leading up to an honours degree.

#### Second Year

Research Project and Dissertation at iThemba LABS (Somerset-West or Gauteng Campuses), UWC, the University of Zululand and other participating organisations (e.g. NECSA, CSIR etc). M.Sc. awarded on successful presentation of Dissertation.

#### Registration

MANuS is a course organized as a collaboration between iThemba LABS and the Universities of Zululand and Western Cape. Candidates can register for their degrees **either** with Zululand **or** Western Cape.

#### Entrance Requirements

MANuS is a **focussed** Masters program designed for entry from a **wide range** of related undergraduate degrees. Candidates will be accepted with first degrees in Computer Science, Physics, Engineering, Chemistry, Mathematics and other Physical Sciences.

#### Grants

Postgraduates taking the MANuS course are fully funded by the NRF Scarce Skills Program and the three participating institutions.

#### Accommodation

Is available in the Residences managed by the UWC.

## COURSE CONTENT

Courses are structured to enable graduates from a wide range of backgrounds to succeed in their studies. Normally candidates will need second year mathematics, or equivalent, as part of their first degree.

### First Year:

- Modern Physics: Space/Time/Matter
- Electromagnetism: Theory and Applications
- Mathematical Methods
- Communication and Presentation Skills
- Nuclear Physics: Introduction, Structure & Reactions
- Quantum Mechanics: Introduction and Applications
- Thermal and Statistical Physics
- Accelerator Physics: Introduction and Technologies
- Environmental Radioactivity : An Introduction
- Nuclear Power Reactors
- Detectors, Electronics and Instrumentation
- Computational Physics
- Practicals and (optional) Project

### Second Year:

Research Projects for Dissertations are available in a wide range of disciplines including;

- Nuclear Structure
- Nuclear Reactions
- Environmental Radioactivity
- Accelerator Mass Spectrometry
- Accelerator Development and Technologies

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is jointly sponsored by the Universities of Western Cape and Zululand and iThemba Laboratory for Accelerator Based Sciences.

**Send applications with CVs to the course administrator:**

Mrs Angela Adams  
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Dept. of Physics

University of Western Cape  
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or

Miss Futhi Nzuzwa  
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Tel: 035-902-6566

Dept. of Physics and Engineering,  
Private Bag X1001, Kwa-Dlangezwa 3886

**Applications close 31 October each year**

**Individual enquiries to:**

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Tel: 021-959-2713

**Further information may be found on**  
[www.tlabs.ac.za](http://www.tlabs.ac.za)

## CAREER OPPORTUNITIES

The skills acquired during this Masters Course are urgently required by a wide range of employers. Eskom is planning to install 10GWe of new nuclear power generators in the coming decade. This will require many skilled people, not only in Eskom but also in the associated supply industries and the National Nuclear Regulator (NNR). New uranium mines are opening requiring radiation health monitoring and the environmentally friendly storage of naturally active tailings. Accelerators are required for the irradiation of cancers and for the production of radioisotopes used by hospitals in diagnosis. It has been proposed that South Africa build a Synchrotron Radiation Source for materials, chemical and biological research. This would be a major accelerator installation involving the most modern technologies.

With the rapid growth of the South African economy there are many demands for the skills acquired on the MANuS program and opportunities for graduates to start their own companies.

Graduates from the MANuS course, who find they have a talent for Research, can also go on to do a PhD. This opens paths to the top of industry, government decision making and academic research and teaching.

## INTERNATIONAL COMPATIBILITY

The structure of this course is modelled on the Graduate Schools in North America and the Higher Degree structure in Europe and elsewhere agreed by 40 nations under the "Bologna Protocol".

