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An Overview of the Department of Physics and Astronomy at University of the Western Cape Natural and Physical Sciences Teacher Development Programme

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6 August 2018

proSET/NSTF Discussion Forum: STEM education and maths reform

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Introduction

A review of undergraduate physics education in public higher education institutions undertaken by the South African Institute of Physics (SAIP) in partnership with the Council of Higher Education (CHE) has identified the major challenge of under-preparedness of university students entering undergraduate physics programmes. As a result, student throughput and retention remains a very large concern for universities in South Africa.

Aims of programme

The programme aims to address one of the most dire scarce skills in South Africa by improving the physics content knowledge and pedagogical skills of natural and physical sciences teachers – thereby increasing above average pass rates for high school in the natural and physical sciences.

Overview of programme

- Physics for Physical Sciences Educators
- Modeling instruction for Natural Science Teachers
- A partnership with High Schools in surrounding areas
- Masters' Degree in Physics Education program to commence in 2019 or 2020

Physics for Physical Science Educators

- Accredited Continuing Education yearlong course,
- Course comprises physics mainstream modules aligned to Curriculum Assessment Policy Statement,
- Promotes the professional development of grade 10-12 in-service physical science teachers,
- Provides comprehensive training in physics content knowledge and pedagogy knowledge.

Modeling instruction for Natural Science Teachers

- Three-year pilot project between the University of Western Cape, Missouri State University (Columbia) and Metro South Education District for Natural Sciences teaching
- Cross faculty
- The vision of the pilot is to prepare the Metro South Education District grades 8 and 9 teachers to become knowledgeable leaders as they learn to teach the physics part of the Natural Sciences curriculum.

Partnership with High Schools in surrounding areas

- Partnerships with high schools from the poorer communities in the surrounding area of University of the Western Cape with teachers who have successfully completed the Physics for Physical Science Educators
- Provide teachers with ongoing support in implementing effective teaching and learning practices in their classes as well as to make the Departments of Physics and Astronomy resources and services available to schools to provide their students with good quality education.

Masters' Degree in Physics Education

- This project is in the pipeline and is still under discussion. It envisages collaborations between the Departments of Physics and Astronomy of the Science Faculty and the Education faculty of the Universities of the Western Cape with possible collaborations with the University of Missouri (Columbus campus). It is envisaged that this program might commence in 2018 or for the latest in 2019.

Challenges

- Provide teachers with ongoing support in implementing effective teaching and learning practices in their classes
- Incentives to encourage teachers to partake in programme
- Expand programme
- Funding
- Monitoring and evaluating programme success

Thank you