

RESEARCH ASSISTANT - COVID-19 MODELLING INTERNSHIP

The Faculty of Science at Nelson Mandela University is looking for Interns ([Senior Undergraduates and Postgraduates](#)) to work with a team of scientists on modeling African country's COVID-19 data. The duration of the internship is from **01 January 2022 – 31 December 2022**



PROJECT OUTLINE

The COVID-19 pandemic continues to have a devastating impact on all aspects of South African society and across all countries in the world. To help inform policies and decisions at our institution, at the local, national, regional, and global levels various epidemiological models have been developed.

In recent years mathematical and computational models have successfully forecasted the spread and impact of epidemics and have been used to communicate the risks of uncurbed infectious disease outbreaks. Mathematical and computational models are ideal as forecasting tools and can also provide situational awareness when we lack good data. The models can yield results that can be used to define counterfactual scenarios that help disentangle the impact of pharmaceutical interventions (such as vaccination) and public health policies.

Mathematical and computational models can inform policy that saves lives. But making accurate assessments about the spread of infectious diseases relies on the availability of reliable and robust epidemiological data.



This project seeks to leverage existing models for COVID-19 epidemics and extend them as appropriate for guiding Nelson Mandela University's response to COVID-19 as well as guiding our stakeholders (Gqeberha, Eastern Cape Province and national government) in responding to COVID-19. The modelling process includes the checking and adjusting of assumptions and model inputs, making alterations to the structure of the model, model calibration to available data for multiple settings, generation and visualization of model outputs, and communication of the model output and its implications for decision making with the various stakeholders. Specifically, models will be developed for South Africa and other African countries. We will construct models in conjunction with a growing geocoded database on coronavirus epidemiology, human movement, pharmaceutical and public health interventions.

THE PROJECT SEEKS TO:

- Contribute to the institutional, local, and national as well regional and continental response to the COVID-19 pandemic.
- Support knowledge generation and translation to inform diagnostics, prevention, and treatment of COVID-19 on the continent.
- Strengthen institutional, local, national as well as African regional and continental science engagement efforts in response to the COVID-19 pandemic.
- Leverage existing, strong multilateral collaborations in support of the institution's consolidated response to the COVID-19 pandemic and attract new collaborations from external stakeholders
- Produce and disseminate coordinated science communication outputs that will allow readers access to information and analysis to inform their actions and challenge misinformation.
- Assist with evidence-based lessons and good practices for science communication, education, and awareness during the COVID-19 pandemic.

DELIVERABLES

The successful applicants for this internship will work with the modelling team to help produce the following deliverables:

1. Inventory of the raw observational data and the scientific publications used to inform the model structure and model parameter values.
2. Model diagrams, to aid communication and discussion of the model and its output.
3. The mathematical equations of the models
4. The code implementation of the models in either C/C++, Python, R, or Wolfram MATHEMATICA programming language, as well as the code used to fit the models to the available data
5. Model output in the form of graphs and tables with accompanying captions.
6. A report detailing the scope of the work, methods used, results obtained and how they should be interpreted when used as input into the decision making around health care, operations, and human resources.
7. Derived from this report: a scientific paper describing the work, for publication in a peer-reviewed journal.



THE MODELING TEAM

The interns will be working closely with members of the COVID-19 modelling team. The team has experience in mathematical and computational modelling.

COMPETENCIES REQUIRED FOR THE PROJECT

- Mathematical modelling
- Computational thinking
- Complex problem solving
- Critical thinking
- Biostatistics and biomathematics knowledge (added advantage)
- C/C++, Python, R, Wolfram MATHEMATICA programming

TO APPLY

Please send your cover letter, CV, and academic record to Ms. Dolly Ntintili at Dolly.Ntintili@mandela.ac.za

Closing date: 26 November 2021

ENQUIRIES

Any inquiries related to the post may be sent to science.marketing@mandela.ac.za

