

Masamu Project Career Development Workshop

December 1, 2011

A lecture and group discussion on Mathematical Sciences Careers in Academia, Government, and Industry was delivered by Dr. Madzvamuse from the University of Sussex, and discussions were led by Dr. Mataramvura from the University of Cape Town. The lecture outlined the following:

1. Why Careers in Mathematics?

Discussions around this topic zeroed in on areas where students after graduating from University, could end up working. It was noted that graduates in Mathematics are employable in almost all sectors of industry and commerce together with sectors of public service that include teaching. In the private sector, it was noted that depending on the development of a country, the industry is likely to value mathematics graduates because of their flexibility to use mathematical models. In Southern Africa for example, some universities have introduced a one-year Industrial Attachment program where Mathematics students are attached to almost all sectors of the economy and work to gain experience. They are also required to produce a report which highlights what contribution they would have made applying the models that they would have learned at college. The objective of such programs is to expose mathematics graduates to a different working environment and also to market mathematics within the sectors of the economy. Through this, employers would end up appreciating the role of mathematics in their sector.

2. Careers in Mathematical Sciences:

Careers in mathematics range from areas of direct to indirect application of mathematics. Areas where graduates can directly apply mathematics range from academia (teaching, lectureship, or faculty career) to industry, especially the finance industry (banks, insurance companies, investment institutions, manufacturing industry, transportation industry, etc.). In these areas, employers usually rely on mathematical models that would have been studied at college in a more general setup and which are then tailor-made for each industry. Areas where mathematics graduates have been employed and where they indirectly use mathematics are usually in service industry (shops, etc.) and in entrepreneurship (i.e. starting their own business, etc.). Therefore, it can be seen that when it comes to employment, the sky is the limit. The main areas of employment could thus be summarized as:

Careers in Academia: These include associate tutors, assistant professors (lecturers), associate professors (senior lecturers), readers, professors, Heads of School/College, etc. It was noted here that Universities have different ways of promoting faculty from one grade to another but the key components common to all universities are research and teaching together with university service. The issue of tenure depends on region. In the US, Universities have probationary periods of an average of 5 years during which time faculty members are expected to excel in the areas mentioned above. In Southern Africa, tenure is mainly in the form of a probation period that ranges from 2 years to 4 years. While the requirements of both tenure and probation look the same, universities are usually less

demanding on probation than their counterparts which have tenure. In Southern Africa, universities put more conditions when one is applying for promotion, whereas in the US, the two can be done at the same time.

Careers in Government: There are numerous careers in Government for mathematicians. These include teaching, regional directors, medical practitioners, researchers/statisticians, army, council/parliament, etc.

Careers in Industry: Careers in Industry are the most recognized, and these include financial analysts, actuaries, computer scientists, engineers, writers, entrepreneurs, etc.

Entrepreneurship

Furthermore, several search engines for Careers in Mathematical Sciences were mentioned, and these include:

_ <http://www.maa.org/careers>

_ <http://www.jobs.ac.uk>

_ <http://academickeys.com/>

_ <http://www.smb.org/>

_ <http://www.ams.org/employment>

_ <http://www.siam.org/careers/>

3. Research at Universities:

Some Universities in Southern Africa motivate research through a system of crediting research papers and supervision of Masters and PhD students with scores which generate money to universities and to the research accounts of the faculty. In South Africa, this system is controlled by the National Research Foundation (NRF). Not all universities in the region however, use the South African model. Those that do not, use promotion as a motivating factor. In the US, both promotion and tenure are motivating instruments, which force academics to do research.

4. General:

Discussions centered on why one should pursue a PhD and how it could open numerous career opportunities. In particular, the discussion centered on PhD empowerment, how to study for a PhD, and career progression paths in Africa versus the Western progression. It was noted that South Africa has different career progression paths in Academia than other countries where MSc graduates are the majority employees of lecturer positions. The need for mentors and mentees was also discussed, highlighting the Masamu Program as a platform to initiate such interactions.