

Uganda: Gregory Sankaran, University of Bath, UK, and Juma Kasozi, Makerere University, Kampala, Uganda

Makerere University is effectively the national university of Uganda. It was founded in 1922 and assumed its present form in 1970, but was practically suppressed during the 1970s and effectively refounded in 1986. The best-known alumnus outside Uganda is probably John Sentamu, Archbishop of York. Mathematics Department (in the Faculty of Science): about 25 staff, several with PhD. There is some research activity and an MSc programme, and there are occasional PhD students, mainly junior members of staff.

Contact: Juma Kasozi, now Head of Department, is mainly interested in financial mathematics but studied algebra earlier and retains an interest in it. John Mango, the previous Head of Department, now Dean of Science, has been very much involved with this programme. He works in numerical analysis.

Requests to MARM were for help with building up strength in pure mathematics, especially algebra, by whatever means seemed most useful, and for assistance for other research groups of possible.

Research: There is some research going on especially in financial mathematics, numerical analysis and biomathematics. Pure mathematics research is very limited but Dr Vincent Ssembatya publishes occasional papers in topology. However, he is the Quality Assurance manager for the university (at a level comparable to a Pro-VC) and therefore has limited time for research.

Initial issues, problems and solutions identified

- The library is adequate at MSc level but is insufficient as a resource for research. A recent donation of books from ICTP and improved internet access has improved the situation considerably.
- Internet access remains slow and not very reliable, largely because of load shedding (i.e. power cuts).
- Teaching loads are quite heavy. Staffing levels have increased, however.
- The only research active member of staff in pure mathematics is Dr Ssembatya. One other member of staff, Dr Saul Nsuguba, has a fairly recent PhD (from Edinburgh) and would like to resume research, but needs help. In applied mathematics there is more activity but contacts and collaborators are needed.
- The teaching resources to run the MSc as it should be run are not always available. The quality of the students is also very variable, but that is not necessarily a serious problem in itself.
- A revised MSc with better structure, both administratively and mathematically, is needed. The mathematical structure has been put in place but the full programme remains an aspiration. More opportunities for PhD students should be created and a serious attempt needs to be made to start research activities, necessarily on a small scale at first.
- There is a good system for collaboration at the level of teaching with universities in Nairobi, Dar-es-Salaam and to some extent Kigali. Maseno University in Kisumu (Kenya) is another possible partner. This does involve a lot of travel. Videoconferencing is not a suitable alternative because of infrastructure issues such as frequent power cuts.

Activities undertaken

The first visit of the mentor took place in September 2008. Apart from general fact-finding and familiarisation, the mentor gave a complete MSc course introducing ring and field theory, eight two-hour lectures in a week. One of the students (David Sseviiri) chose to write an MSc project on a related topic, which is now complete.

A second visit took place in March and April 2009. This time the mentor gave some lectures, again at MSc level, on topology, complementing lectures by Dr Ssembatya; completed the assessment of the algebra course from September; discussed the MSc project; and began to think about the possible future shape of the MSc, in response to questions from the staff. Two more MSc students expressed some interest in possible MSc topics in pure mathematics and one of them (Patrick Muwereza) started work on a project under my supervision. The mentor made important contributions to the Master's course at Makerere, through talking with the students, supervising the dissertations of these two students, and most importantly in trying to assist an extremely able young student, David Sseviiri to find a PhD place either in Europe or based in Kampala but with a European co-supervisor. A final possibility is for David to study in South Africa, which looks the most likely outcome.

The mentor started discussions with Dr Nsuguba on a possible joint research project. Another student on that course, Hayato Mwesigwa, is now studying at Clemson University in South Carolina and a third, Kurama Onesfole has completed a Masters project with some guidance from me and is now studying at Lappeenranta University of Technology in Finland.

A final visit took place in February 2011, where a graduate course was again given. One member of the department at Makerere has visited Bath, and financial assistance was made to staff members attending the ICM, and for their attendance at local conferences.

Useful guidance was given by the mentor as the university restructured its Masters programme, which seems to have been successful since the number of students on the programme has risen sharply.